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Six working papers written as part of the National Planning Association's pilot study of the implications of economic and social change for educational policy in the 1970's and 1980's make up this volume. Attention is directed toward current and future social and economic challenges to education and the potential responses of the educational system to these challenges. The titles of the working papers are (1) "Education in Low-Income Areas During the Next Two Decades," (2) "The Systems Approach to Educational Systems Planning," (3) "Changes in Educational Technology and Their Implications for Education in the Next Two Decades," (4) "Economic Changes, Manpower Requirements, and Their Implications for Educational Policy in the Next Two Decades," (5) "Educational Change for Manpower Development," and (6) "The Social Bases for the Education of the Negro American Urban Poor During the Next Two Decades." A related document is EA 002 044. (TT)

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Education in Low-Income Areas During the Next Two Decades

by

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Working Paper

for

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EDUCATION IN LOW-INCOME AREAS
DURING THE NEXT TWO
DECADES

INTRODUCTION

The Problem

This study attempts to examine the structure and function of the urban educational system in relationship to the social and economic conditions of families residing in low-income urban areas. Within this broader context, special attention is given to education as a mechanism for contributing to the national manpower requirements from the ranks of the urban poor. Next, the analysis concentrates on the structural aspects of the educational system for an insight to probable trends over the next twenty years, at the same time underscoring the labor force implications. Finally, an effort is made to identify the type of research needed to yield the best information on which effective educational policy decisions must be made for families of low-income areas.

Background

The urgent need for finding solutions to the complex problem of educating residents of low-income areas cannot be overemphasized or overstated. Evidence that this is one of the most critical contemporary problems is too clear to even be discussed. The warnings of the dangers from numerous responsible individuals and institutions are constant and frightening. For example, in reference to adults, the poverty areas of San Antonio, New Orleans, and Phoenix, between 40 and 50 percent of the labor force is either unsuccessfully searching for a job, has given up on trying to find one, or has settled for low paying part-time work. Along these same lines, in New York City between 25 and 30 percent of the labor force in East Harlem, Central Harlem, and Bedford-Stuyvesant cannot find work. (1) Based on these data, in contrast to the country's general prosperity, the New York Times concluded:

> "The two nations of contemporary America must be made one economically as well as politically. But a vast educational effort will be required to make today's unemployed and underemployed minority group members even minimally competitive with the rest of the population for the jobs that are available. When will the energy and funds needed for the vast task begin to be available?"

Turning to elementary-secondary public school education we have the same type of concern. The Moynihan Report revealed that the educational attainment of the civilian non-institutional population 18 years or older was 9.2 and 10.0 for non-white males and females (the chief ghetto inhabitants) as opposed to 12.1 for both white males and females. Also, that the percent of non-white youth enrolled in school and one or more grades below the mode was from 7.9 percent of males and 5.8 percent of females in the 7 to 9 year-old age group to 57.3 percent of males and 46.0 percent of females in the 18 to 19 year-old age group. (2) More specifically, the Coleman Report indicated that at grade 6 the average Negro is about 1-½ years behind the average white child in educational achievement, 2-¼ years behind at grade 9 and 3-¼ years behind at grade 12. (3) More basically, research has consistently indicated that children from low-income areas have lower average I.Q.'s than children from more favorable homes. The scores on such tests tend to decline as the child grows older. For example, in New York City, in some low-income areas, variations in I.Q. related to grade were as follows: grade one - 95, grade three - 92, grade six - 87, grade 8 - 82. This grade I.Q. of 82 is only two points short of a mentally retarded classification of an 80 I.Q. in some states. (4) This supports Frankel's contention that at age 4, approximately 25 percent of the mentally retarded population is composed of children from low-income families whereas the age 9 group of retardates is composed of approximately 50 percent of poor children. (5) Such findings related to a decline in I.Q. as the child from a low-income area grows older is obviously related to an educational repressive social structure rather than a genetic deficiency. Therefore, there is an unknown number of disadvantaged children classified as retarded, but are not true retardates. Their low performance on I.Q. tests is associated with a failure to develop their intellectual potential rather than an inherited limited ability to learn. Incidentally, this has served as the strongest case against the "culture free" and "culture fair" claim of intelligence tests.

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(1) The New York Times, August 8, 1967, p. 13.

(2) The Negro Family: A Case for National Action, Office of Policy Planning and Research, United States Department of Labor, March, 1965, p. 31.

(3) James S. Coleman, et al. Equality of Educational Opportunity, Washington, D.C., Office of Education, Department of Health, Education and Welfare, 1966, p. 273.

There exist countless other statistics and research studies of the urban poor that paint an equally bleak picture as those cited above. There are those concerned with dropouts, (6) disadvantaged child's learning process, (7) discrimination, (8) protest, (9) income, (10) poverty in general, (11) etc. The sum total of these studies add up to one thing, low-income families rate lowest on every conceivable social index. These are the conditions which have provoked such stinging responses as Conant's, in reference to unemployed youth in the slums, who simply states, "It is social dynamite", (12) and panelist Robert L. Green, Director of Education for the Southern Christian Leadership Conference, to say that the educational system "has been a failure" and "set up systematically to make second-class citizens of Negro children". (13)

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(4) Frederick Shaw, "Educating Culturally Deprived Youth in Urban Centers", Phi Delta Kappa. November, 1963, p. 92.

(5) Figures based on an interview and unpublished material of Dr. Max G. Frankel, Director, Department of Exceptional Children, School of Education, The Catholic University of America.

(6) Daniel Schreiber and Bernard A. Kaplan, Guidance and the School Dropout, National Education Association, 1964.

(7) Martin Deutsch, "The Disadvantaged Child and the Learning Process", in A. Harry Passow, ed., Education in Depressed Areas. New York: Teachers College Press, 1963.

The problem can be reduced to how can the educational system be geared to meet the need of urban low-income families. If something isn't done, and quickly, there will be further deterioration rather than improvement. In 1950, approximately one out of ten attending public schools in the nation's fourteen largest cities was culturally disadvantaged. In 1960, it was one out of three, and estimations by some authorities are one out of two by 1970. (14) Secondly, by mid 1975 the population is expected to increase to 226 million. (15) At the present time, there are already approximately thirty-five million Americans in the poverty category out of a total population of 200 million. (16) Thirdly, along with an increase in the total population there will be an increase in the number of youths between 16 and 22 and in minority group members - the two categories containing the largest proportion of the unemployed. (17) In relation to the minority group, Moynihan states:

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(8) George Eaton Simpson and J. Milton Yinger, Racial and Cultural Minorities. New York: Harper and Row, 1965.

(9) Louis E. Lomax, The Negro Revolt. New York: Signet Brooks, 1963.

(10) Herman P. Miller, Rich Man, Poor Man. New York: Thomas Crowell, 1964.

(11) Michael Harrington, The Other America. New York: Macmillan, 1963.

(12) James B. Conant, "Social Dynamite in our Large Cities", in August Kerber and Barbara Bommarito eds., The School and the Urban Crisis. New York: Holt, Rinehart and Winston, 1966, p. 170.

(13) National Conference on the Education of the Disadvantaged, July 18-20, 1966, p.1

(14) Frederick Shaw, "Educating Culturally Deprived Youth in Urban Centers", Phi Delta Kappa, November, 1963, p. 91.

(15) Leonard A. Lecht, Goals, Priorities, and Dollars: The Next Decade. New York: The Free Press, 1967.

> " as with the population as a whole, there is much evidence that children are being born most rapidly in those Negro families with the least financial resources. This is an ancient pattern, but because the needs of children are greater today, it is very possible that the education and opportunity gap between the off-spring of these families and those of stable, middle class unions is not closing, but is growing wider".

Consideration of these facts in combination clearly indicates that educational institutions must "get with it" long before 1985 if the national educational line expects to hold its own, let alone gain yardage. Already the question is being raised "can the city centers be saved"? (18) A somewhat related question is can the public educational system, as it stands, deliver? Kenneth Clark has doubts and James Coleman doesn't think that it can. In fact, Neil V. Sullivan recommends closing down the public schools and overhauling them completely. (19)

Scope of the Study

This study is concerned with the education of families in urban low-income areas and related aspects such as employment. It is recognized that conditions of rural depressed areas pose equally difficult educational problems; however, this paper will be confined to the urban low-income areas.

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(16) Interview with Dr. William Odom of the Office of Economic Opportunity, August 21, 1967.

(17) The Washington Post, August 7, 1967.

(18) John Chamberlain, Columnist, The Washington Post, August 11, 1967.

(19) Newsweek, "The School Crisis: Any Way Out"?

The climate and character of most urban low-income areas cannot be fully understood without an understanding of the population movements in the United States during the past half century. In 1910, the United States population was 54.3 percent rural and 45.7 percent urban. By 1960, it had shifted to 69.9 percent urban and 30.1 percent rural. Numerically, in 1960, 115.7 million Americans out of a total population of 180.7 lived in metropolitan areas. (20) A little over half of the 115.7 lived in the central city, while the remainder 57.3 million lived in the suburbs. Finally, by 1960 approximately 62 percent of all Americans were concentrated in 212 standard metropolitan areas. Such an area is defined by the Bureau of Census as "one or more contiguous counties containing at least one central city of over 50,000 population as the core of an economically and socially integrated cluster of people". (21)

Although the overall population of the metropolitan areas increased enormously between 1910 and 1960, there was a striking population shift within the boundaries of these areas characterized by a movement of thousands of people from the central cities to their respective suburbs. In turn, in-migration into the central cities replaced those that relocated in the suburbs. The nature of this population exchange in the central city lies at the center of the urban low-income area problem. For example, between 1950 and 1960, New York lost about 1,300,000 middle class white families that was replaced by 800,000 Negroes and Puerto Ricans. Thousands of Southern Negroes and Puerto Ricans have settled in northeastern cities such as Newark and New York. Southern Negroes and Appalachian whites have migrated to Baltimore, Detroit, Cincinnati and other cities of the Middle West.

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(20) Department of Commerce, Bureau of the Census, U.S. Census of Population, 1960, Volume 1.

(21) Department of Commerce, Bureau of the Census, U.S. Census of Population, 1960, Volume 1, p. 3.

Thus there exists a pattern of in-migrating underprivileged families replacing middle class families within the central city of a metropolitan area.

The problems are overwhelming for the educational system of the central cities due to the life styles of the in-migrating groups. In comparison to middle class families, the adult members of these underprivileged families are usually lacking in education, earning power, and occupational skills; have more children, diseases, and accidents; have less food, clothing, and shelter; have less of an understanding of "city life", community pride, and neighborhood interest; are less verbal, more suspicious, and easily exploited, etc. Such conditions existing within the hundreds of underprivileged families crowded into a common geographical area within the city results in overcrowded neighborhoods and schools, unsanitary streets and alleys; a burden on the welfare department, police force, city hospitals, and voluntary social and health agencies; an overload on the recreational facilities, juvenile courts, and detention homes, etc.

In summary, the scope of the study within the preceding context, includes an analysis of the educational system and its employment for youth and adults of low-income areas within the central city of a metropolitan area. It is acknowledged that other social systems such as the family, religious, and governmental are perhaps equally important as the economic in examining the relevance of the educational system to families in low-income areas, however, attention will be primarily given to education and employment.

The Educational System and Manpower Requirements

The demand for unskilled workers in agriculture, industry, defense, and health services is rapidly decreasing. (22) The unskilled laborer comprised approximately 10 percent of the total labor force in 1965, a percentage which has presently dropped even more. (Of course the unskilled labor force is primarily composed of members from low-income areas.) Secondly, projections for 1985 suggest there will be a marked decrease in major occupation groups of (1) farmers and farm managers, 52.3 percent, and (2) laborers, 15.1 percent. (23) On the other hand, there will be a moderate increase in (1) clerical and kindred workers, 55.1 percent, (2) sales workers, 42.7 percent, (3) craftsmen, foremen and skilled workers, 44.9 percent, and (4) service workers, including private household, 60.2 percent. A study conducted by Dr. Lecht indicated that some of the largest increases in expenditures in pursuit of national goals could be in the areas of area redevelopment, education, and health. (24) The level of education associated with these occupation groups and goal areas is fairly high. This suggests that the educational system must find a way to hold a larger percentage of high school graduates from low-income areas. It also means an effective way must be found to train and retrain the adults.

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(22) Rolf W. Tyler, "Innovations in Our Schools and Colleges", paper presented at the White House Conference on Education.

(23) Projection of the National Planning Association.

(24) Leonard Lecht, Goals, Priorities, and Dollars -- The Next Decade. The Free Press, 1966, Table 1-2.

Feldman flatly states, "the schools have a major responsibility in the field of manpower development". (25) He points out that each year over three million students leave secondary education. About one million go on to college, one million remain and complete high school, and the remaining drop out before they graduate. Only about 400,000 of the two million, going into higher education or graduating from high school, have had some training in some type of marketable skill. It appears that such training is primarily done outside of the formal education system through such programs as Job Corps, Manpower Development and Training, Neighborhood Youth Corps, etc.

Conant expressed a great concern for the large number of unemployed youth, as follows:

> "The task with which the school people must struggle in the city slum is, on the one hand, how to prepare the youth for getting and keeping a job as soon as he or she leaves school and, on the other hand, to encourage those who have academic talent to aim at a profession through higher education." (26)

He was also concerned about the lack of jobs and the necessity for training those displaced by automation; the role of the school for training average and below average youth for work and helping them make a transition from school to work; and coordination between the schools, employees, and labor unions. Dr. Conant, perhaps speaking for thousands of slum observers, summed up his view this way:

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(25) Marvin J. Feldman, Public Education and Manpower Development, A Ford Foundation Reprint, June 27, 1967.

(26) James B. Conant, Social Dynamite in our Large Cities: Unemployed, Out-of-School Youth. Op. Cit., p.1.

> "there are those who would say that what goes on in the schools should not have any direct connection with the community or the employment situation. I completely reject this idea. The school, the community, and the employment picture are and should be tied together...To sum up, I submit that in a heavily urbanized and industrialized free society, the educational experience of youths should fit their subsequent employment." (27)

Looking at the problem from another direction, the high school dropout rate, which is comprised of a large number of unemployed youth, is estimated as 45 percent for low-income (under $3,000) families as opposed to approximately 8 percent for families earning $7,500 or over. (28) The relationship between high school dropouts and family income is shown by the following table. (29)

Family Income and Percent of High School Dropouts

Family Income	Approximate Percent of Dropouts
Under $3,000	45
3,000 - 4,999	26
5,000 - 7,499	17
7,500 and over	8

The 45 percent dropout rate is partially responsible for the high rate of juvenile delinquency in low-income areas. Loble and Wylie think that the development of skills is the key to reducing this problem. (30) They maintain that a high school diploma doesn't mean a great deal if the graduate doesn't have an occupation - a marketable skill that will command income. The relation between family income and percentage of dropouts shown in the above table is not intended to make a case for cause and effort factors. Family income is probably a manifestation of a host of other variables.

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(27) Ibid., Conant's underline.

(28) National Committee for Support of the Public Schools, Education in the United States, 1966, p. 11.

(29) Ibid., p. 11.

It is very clear that a strong relationship should exist between the educational system and development of job skills, particularly for low-income areas. The well known correlation between education, occupation, and income certainly needs no documentation here. The relationship of manpower requirements should not necessarily be confined to vocational education but academic as well. Sewell and Shah found that only about 50 percent of the boys and 25 percent of the girls with the highest ability, according to rank in their high school graduating class quartile but lowest socio-economic quartile eventually attend college. On the other hand, 90 percent of the boys and 75 percent of the girls who were in the highest ability quartile and high socio-economic level eventually attended college. (31) This suggests that high schools in low-income areas should offer alternatives to the high achieving academically oriented student that would permit him to earn enough in some part-time occupation to sustain himself in college. The reason often given for these students that are not attending college is that they lack motivation. This is open to question. The lack of financial support could just as easily be the primary reason.

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(30) Judge Lester H. Loble and Max Wylie, Delinquency Can Be Stopped. New York: McGraw-Hill Book Co., Inc., 1967.

(31) William H. Sewall and Vimel P. Shah, "Socio-economic Status, Intelligence and the Attainment of Higher Education", Sociology of Education, 40, 1 (Winter, 1967), p. 13.

It is emphatically stated that any discussion of vocational education with respect to youth and adults of low-income areas is not meant to suggest that this kind of training should take preference over the academic type. There is no type of Booker T. Washington philosophy that underlies the authors' thinking in considering the education of the urban poor.

LOW-INCOME AREAS AND EDUCATIONAL ISSUES

The school is under tremendous pressures to become more involved in the lives of youth--particularly inner-city youth. They are also under great pressure to become involved in the training and retraining of adults. In the case of the latter, according to Feldman, the school is losing by default to such programs as Neighborhood Youth Corps, Job Corps, Manpower Training and Development and local programs such as Work Training Opportunity Program in Washington, D C. The constantly changing society poses questions to the educational system which must answer for the population in general and members of low-income families in particular.

What kind of support can the educational system give to those it is responsible for introducing into a highly complex technological society? What kinds of adjustments should it make or can it make for the projected change in the labor force? Can the system assist youth and unskilled adults to understand the implications for living in an urbanized society which will become even more urbanized by 1988? In short, can the educational system assist its student participants to be flexible enough to deal with a continuously changing society?

On the other hand, the educational system is faced with countermanding forces. There are demands for more conformity and uniformity but also an emphasis on individuality and creativity; a demand for more effective vocational training as well as for a strong liberal arts program; an extension of mass education and at the same time an emphasis on individualized instruction; and so on.

The next twenty years will require increasingly more revisions of all facets of the school: school design, inservice training, counseling and diagnostic services, more adequately organized special education programs, curriculum, teacher training, instruction, use of teacher aides, and so on. Following are selected areas of current issues in education with a brief discussion of their relevance for low-income areas.

Curriculum Development

Although there is an unquestionable need to bring the curriculum in line with education, some experts are concerned that curriculum development does become viewed by the curriculum reformers as a cure for all educational illnesses. (32)

The reform in curriculum began in the early 1950's and included a large amount of projects throughout the country. Educators were forced to review what children were taught and why they were taught in the manner they were. According to Sizer, the new curricula did raise standards. Students were required to absorb more material in shorter periods of time, high school standards were raised, and finally college professors turned their attention to the problem.

The above are some of the contributions cited to the credit of the curriculum reformers. There are also difficulties. The chief criticism of the movement is that it accepts the way in which schools are presently organized. The argument is that the reformers ignored the interaction between students and teacher as well as an interaction between students and curriculum. Secondly, the reform curricula have not been examined since the mid-fifties, therefore, they are accepted as they are. Thirdly, a question of the teacher's autonomy is raised. The teacher has little opportunity to deviate from the curriculum package which in some circumstances is desirable, but in others is frustrating to a creative, competent teacher. And fourthly, after a curriculum is developed, it is treated as if this is an end product. But the requirement for modification and reworking is a continuous one.

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(32) Theodore R. Sizer, "Classroom Revolution: Reform or Panacea?" Saturday Review, XLVIII, 25 (June 19, 1965).

The curriculum development movement was a great step forward in the educational system. The movement has special meaning for low-income areas, because underlying the movement is an assumption that what is taught as part of the education process must have some relevancy to the existence of the intended learner. On the other hand, the learner's environment is constantly changing, and therefore, periodic examinations of the curriculum are of utmost importance. Development of a curriculum containing books, course guides, laboratory equipment, slides based on an environment known and understood by culturally deprived children can function and be electrifying in the hands of a skilled teacher. We all have seen teachers of great showmanship hold a discipline-problem class spellbound.

The same approach is applicable for training adults. The everlasting complicated problem is to develop materials that are of interest to an adult but at the same time are not too difficult for the adult student to handle.

Nongraded Schools

There are a number of schools present throughout the country that no longer are using the grade labels such as third, fourth, fifth, etc. The University Elementary School of the University of California at Los Angeles numbers among the well known ones. However, nongraded schools are not similar. There is disagreement as to what nongrading should be. They are all alike in one aspect and that is that the grade label has been removed from a portion of the school. The University Elementary School is the only gradeless one known to the authors.

Most nongraded schools are founded on a concept that the organizational structure allows students to move through a body of material at their own rate of speed. Thus, the variation in individual rates of progress has been accounted for.

Goodlad defines the nongraded school as a conception plan embracing simple principles of "child development, learning, school functions and pedagogical practice," (33) as follows:

> "First, children are different, much more different than we have up to now recognized. We have been shamefully remiss in taking these differences into account in our planning and teaching.
>
> Second, in seeking to provide intelligently for these differences, educational diagnosis of and prescription for the individual is essential. Mass techniques and common expectations for all are inimical to these highly sensitive human processes.
>
> Third, there must be alternatives from which to fill the prescriptions. A monolithic school structure with only pass or fail as the alternatives in regulating pupil progress simply does not square with the range of alternatives necessary to coping imaginatively with human variability.

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(33) John I. Goodlad, "Nongraded Schools, Meeting Children as They Are", Saturday Review, XLVIII, 12 (March 20, 1965).

> Fourth, the proper question to ask in starting a child off to his school career is not "Is this child ready for school?" but, "What is this child ready for?" This is the most pregnant idea and is, indeed, at the heart of the nongrading.
>
> Fifth, criterion standards replace normative standards based on group performance..................It has been estimated that 25 percent of children in school receive 75 percent of the failing grades based on normative standards. These children ultimately come to regard themselves as failures -- not just in school, but in life itself.
>
> Sixth, sound learning is cumulative. That is, the child's progression should not suffer from what psychologists call retroactive and proactive interference. A percentage problem for the child has no conception of parts and wholes, let alone the number base on which percent depends, contaminates his present mathematical knowledge and interferes with what follows. Such is the happy, cumulative product of several "bare passes" in a graded system." (34)

The six points underlying the nongraded school enumerated in the long Goodlad quote summarize in total what education is "all about" for the deprived child. Points one through three are equally applicable to educating culturally deprived adults. These measurements are requirements for the educational members in very low-income areas regardless of whether the organization structure be nongraded or some other form. The important message is that teaching material cannot be separated into equal amounts and served in yearly increments to students of the same age category. The entire graded system is predicated on an assumption that children of the same age are ready for the same amount of material over the same time period.

Most of the children from low-income families are not ready to master the work even upon entering kindergarten. (This problem gave rise to Project

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(34) Ibid., pp. 58-59.

Headstart. As one of the most successful programs of the Office of Economic Opportunity, it has been discovered that the progress made with the deprived preschoolers is very quickly offset after the child enters school. This has given rise to Project Follow Through.) The method of non-promotion for the children that do not master the required material in a specified time period is not effective.

The nongraded school as a replacement for the graded system has other advantages for deprived children. For example, the usual fourth grade class will consist of children achieving, in certain aspects of their work, anywhere from second to sixth grade. "The average spread of achievement is four years."(35) In the area of reading, the spread of achievement is even more dramatic. Children in a fifth grade class can range from second through tenth grade in reading ability. A common solution to this problem in the graded schools is to place a group of children at the same level of achievement in the same classes. The problem with this corrective measure is that in considering each child there is a variability in level of achievement based on subject area. A sixth grade student could have a fifth grade reading level and be at the seventh grade level in arithmetic.

A nongraded school forces the teachers to consider much more than passing or failing the students when a decision has to be made to move a child. A great deal of knowledge is needed about the child relating to his home and school environment, his personality, success and failures, etc. This kind of personal interest taken in the student is one of the culturally deprived child's needs.

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(35) Ibid., P. 59.

Quality and Quantity of Education

Warner, Havighurst, and Loeb, in the early 1940's, discussed how school systems responded to the community values to select from the population those who use its resources for social mobility. (36) Hollingshead described the process in more detail. (37)

The quantity and quality received by children is by and large a function of the state. Therefore, the wealth of each state coupled with its willingness to support education will determine the quantity and quality. However, federal expenditures under the Elementary and Secondary Education Act, Manpower Development and Training Act, expanded National Defense Education Act, all of 1965, and the Vocational Education Act of 1965 have strengthened in general the state education programs. The Economic Opportunity Act has also pumped money into the city school systems.

The works of Warner, Havighurst, Loeb, and Hollingshead show how a student's social-class position affects his role within the school system. Sexton also identified the difference that social origin makes in the type of school attended.(38) Schools in the low-income areas fell significantly below those in better areas on almost all measures. These schools were older, had inferior recreational and educational facilities, and tended not to have remedial programs despite the great need. A greater proportion of the teaching time in low-income areas was provided by substitutes. In addition to this, there are those who feel children from low-income areas receive less instruction than other children. (39)

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(36) William L. Warner, Robert J. Havighurst, and Martin B. Loeb, Who Shall Be Educated? New York: Harper and Row, 1944.

(37) August B. Hollingshead, Elmtown's Youth: The Impact of Social Classes on Adolescents. New York: John Wiley and Sons, Inc., 1949.

(38) Sexton, Patricia Cayo, Education and Income. New York: The Viking Press, Inc., 1961.

Sexton noted in her study that children from low-income areas perhaps receive less instruction in another way. These children change school more often, leave more often, and are ill more often. In short, they have a lower attendance rate.

There is some evidence indicating that teachers perceive and treat children from low-income families differently from other children. Riessman firmly believes the middle class orientation of school personnel is a holdback to deprived children. (40) Along these same lines three problems were cited by Becker: (1) teaching itself, (2) discipline, and (3) moral acceptability of the student. Students from low-income areas were cited as the most difficult to teach and control, and as having the most undesireable values concerning sex and aggression, cleanliness, ambition, and work. (41)

There are countless techniques and methods designed to improve the quantity and equality of education for students of low-income areas. Among them are decentralized school systems, educational parks, quota systems, and so on. Many of these are centered around a more racially heterogeneous grouping of children.

Addenda

There are innumerable contemporary educational issues which could have been discussed. Among them are:

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(39) Richard A. Cloward, James A. Jones, "Social Class: Educational Attitudes and Participation", in A. Harry Passow, ed., Education in Depressed Areas, New York: Teachers College, Columbia University, 1963.

(40) Riessman, op.cit.

(41) Howard S. Becker, "The Career of the Chicago Public School Teacher", American Journal of Sociology, 27 (October, 1953), pp. 128-139.

1. Teacher Training -- Universities, led by Columbia Teachers College and New York University, are beginning to recognize the need to train teachers specifically for assignments in inner-city areas. This calls for a different teacher training model than the traditional. It requires a de-emphasis on teaching methods and classroom procedure and a greater emphasis on the psychology and sociology of the culturally deprived. Careful attention is given to the selection of teachers. The academics, student teaching, and field work components of the program are combined in such a way that the student is involved in all three areas on entry into the teacher training program. A clearly defined urban education program has emerged from such a combination. The Teacher Corps, Prospective and Experienced Teacher Program of E.S.E.A., and NDEA Institutes have stimulated the change in teacher programs on behalf of low-income areas.

2. Innovation: Educational Technology Based Materials and Equipment -- Unquestionably, educational technology, even though belated, has a significant contribution to make as indicated by pilot projects in New York City, Chicago, and Greeley, Colorado. The New York projects are concerned with educating both youth and adults from low-income areas. The data thus far indicate that the effect in raising the reading achievement level is dramatic among both groups. The same results are coming from Chicago and Greeley. All three projects are sponsored by O.E.O. and consist of using the talking typewriter in varying degrees in a Responsive Environment System as

formulated by Dr. O. K. Moore of the University of Pittsburgh. A project at Stanford University is enjoying the same success with a computer assistance program.

Emerging from the field of educational technology with its powerful learning psychology theoretical base, are guidelines which could completely revolutionize the entire educational field across all socio-economic classes and levels of schools. At the moment its application is especially critical for low-income areas based on a priority of need. Software such as programmed learning text books, films, slides, transparencies, and hardware such as teaching machines, educational television, and computer assistance programs are among the things which have a great deal of promise for low-income families, pending the results of innumerable pilot projects which are experimenting with their educational effects. Oakland Junior College in Oakland, California, and Christian Brothers Junior College in Oklahoma City, are established on entirely automated educational technology bases.

The use of educational technology is, however, still an issue. There remains resistance from many educators of all professional levels. Their warning of caution that educational technology should not be treated as a panacea should be noted. On the other hand, as the results of pilot projects continue to arrive, the capability of educational technology in a variety of settings is being rapidly defined.

3. Vocational Education -- As far as the needs of low-income families are concerned, there is absolutely no question as to the necessity for

reexamining vocational education for both youth and adults. Vocational education and academic education should not be a dual system for either adults or youth of low-income areas. In the case of youth, there are two outstanding needs. One is the need to provide those who are capable and interested in going to college with a set of skills that will permit them to secure semi-skilled and skilled part-time work in order to finance their way through higher education. It has been found that of the youth from low-income areas that finish in the top one-fourth of their class, only about 60 percent go on to college. There simply isn't enough financial support available in terms of family, scholarship, government support, etc. (It also has implications for counseling in the high schools.) If these youths were able to develop some skills in a vocational occupation, they would be able to gain employment to finance their way through college. As for the vocational training for vocational education students who expect to terminate their education after high school graduation--they need to have had developed enough academic skills to satisfactorily communicate with their employers and employees. Promotions depend upon this.

Turning to adults, separation of adult education and vocational education is also objectionable. Adult education for adults from low-income areas tends to be too abstract and not economically meaningful. "That political science course won't put a dime in my pocket, besides, those politicians do any damn thing they want to anyway. Why should I learn about what they are supposed to do?" Vocational education usually assumes a certain level of reading ability which the majority of low-income adults don't possess. The ghetto is filled with people who have great potential for vocational training if they had the basic education required to absorb the material.

In summary, there is a need to revamp vocational education to bring it in line with the employment needs of families from low-income areas. There is also a need for someone to take the responsibility for coordinating the efforts of all segments of the educational system as related to vocational education. The pulling together of the public schools, labor unions, trade schools, and industry to define the role and function of each would be of great help to low-income areas. Knowledge alone of the organization of effective vocational training programs conducted by industry, as well as the armed forces, would be a giant step forward.

4. Decentralized School System -- A common estimation is that no one school board should control an area with more than 50,000 children. The argument is that within an urbanized area there is such a wide variation in the social and economic background of various groups that one policy-making body is incapable of understanding what is educationally appropriate for all these groups. Decentralization is viewed as a solution to this problem.

Within this wider issue of decentralization lies another, having to do with participation of low-income parents in the educational decision-making process. School boards are, led by New York City, struggling with dissident residents of low-income areas. These residents are demanding that they have a voice in policy-making matters. The pickets, sit-ins, disruptions of board meetings, etc., are the symptoms reported daily of this underlying discontentment of perceived exclusion by the parents.

5. Integration of Schools -- As described earlier, the population of

the central cities of metropolitan areas is changing rapidly to that of minority groups. It has, of course, changed the problem of de jure segregation, struck down by the 1954 Supreme Court decision, to one of definite segregation. Political boundaries have seriously limited the school board's ability to deal with the problem. For example, in Washington, D.C., 90 percent of the children in public schools are Negroes. This means there are approximately 15,000 white children in a school system of 150,000 students. The question arises--how does one integrate 15,000 white children into 135,000 Negro children? Cities around the country are asking this question.

In regards to this problem, there are signs appearing which seem to indicate that residents of low-income areas are setting aside this question of integration and concentrating upon the quality of education. We find some residents, particularly Negroes, in low-income areas are demanding a right to screen the white teachers. The same groups are opposed to bussing students for purposes of integration and demanding the schools in their areas to incorporate a wider range of courses and more enrichment programs. It should be added that there is a counter-force, as indicated by Judge Skelly Wright of the District Court in Washington. D.C. Judge Wright abolished the school's track system, required bussing of students, and ruled illegal the use of optional zones.

The next section is devoted to the explanation of a social systems model believed useful for analyzing the educational system. This model is then applied in the following sections of the paper to establish certain relationships and to generate a number of hypotheses with respect to these relationships. Because education and employment are the essential concerns of this paper, the analysis based on the model will also be confined to these areas.

GETZEL AND THELEN SOCIAL SYSTEM MODEL

Getzel and Thelen have developed a model which takes into account the psychological, sociological, anthropological, and biological dimensions of any social system. More importantly, the model permits an assessment of the interaction of these dimensions and their impact on the observed behavior of participants of the social system; for example, teachers, administrators, counselors, students, psychologists, etc. of the education system.

A social system as conceived by Getzel and Thelen involves two classes of phenomena "which are at once conceptually independent and phenomenally interactive". (42) One, there are the goals and expectations of the system. Two, there are individuals in the system with unique personalities and "need-dispositions". (43) The interactions between individuals in the system comprise the group behavior. The behavior of these individuals, according to Getzel and Thelen, can be viewed as a function of three major elements. They are institution, role, and expectation and defined as the nomothetic dimensions of activity in a social system. The individual, personality, and need-disposition are the idiographic or personal dimensions of activity. Getzel and Thelen suggest:

> "To understand the nature of observed behavior and to be able to predict and control it, one must understand the nature of the relationship of these elements." (44)

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(42) Jacob W. Getzel and Herbert A. Thelen, "The Classroom Group as a Unique Social System", in the Dynamics of Instructional Groups, Socio-psychological Aspects of Teaching and Learning, the 50th Yearbook of the National Society for the Study of Education, ed.,Nelson B. Henry, 1960, pp. 115-135.

(43) Ibid., p. 65.

(44) Ibid., p. 66.

Institutions. All social systems have some prescribed functions which are to be discharged in an established way. The functions such as educating, governing, producing and distributing goods, etc., become institutionalized and the agencies carrying out these institutionalized functions for the social system are called institutions. For example, the elementary, secondary, vocational, etc., schools are institutions at one level of analysis. At a broader level of analysis, the sum total of all these schools would be educational institutions responsible for teaching and training youths and adults.

Roles. The privilege, responsibility, or obligations, etc., of a position in the social system. For example, a teacher has certain privileges and obligations within the classroom setting.

Expectation. The specific actions expected of the individual occupying a position (status) with certain privileges, obligations (role). For example, the teacher is expected to present learning material, maintain order in the classroom, receive respect from the students, etc. In summary, nomothetic dimension graphically appears as follows: (45)

Social Systems ⟶ Institutions ⟶ Roles ⟶ Expectations
Institutional Goal-behavior ⟵

The elements constituting the nomothetic aspects of group behavior, as represented schematically above, emphasizes an analysis of the educational system, from a sociological viewpoint, to understand the observed behavior of participants within the system. The analysis may be extended to determine how education as a social system is related to economics or the family, also social systems.

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(45) Ibid., p. 67.

Roles are occupied by individuals, and every individual is unique, therefore, no two individuals will perform the same role exactly alike due to individual personality differences.

The principals of two different elementary schools will not run the schools exactly alike even though there are policies and procedures outlining in a detailed way what they may or may not do. This, of course, introduces the idiographic or personal dimension of observed behavior which comprises the elements of individuals, personalities, and need-dispositions as schematically presented below. (46)

Social System → Individuals → Personalities → Need-Dispositions → Individual Goal Behavior

It is in the idiographic dimension that an understanding between the behavior of two principals, teachers, or counselors can be understood even though the role and role-expectation are constant for each pair mentioned. Therefore, to understand the behavior and interaction of a participant in an institution, both the role expectations and need-dispositions must be known.

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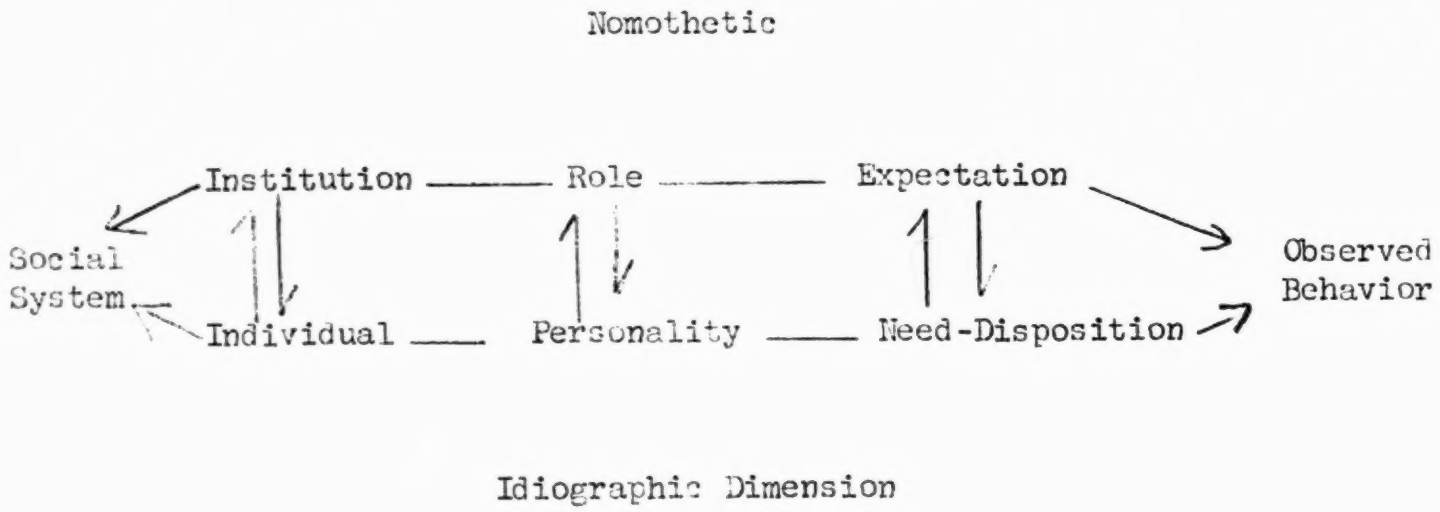
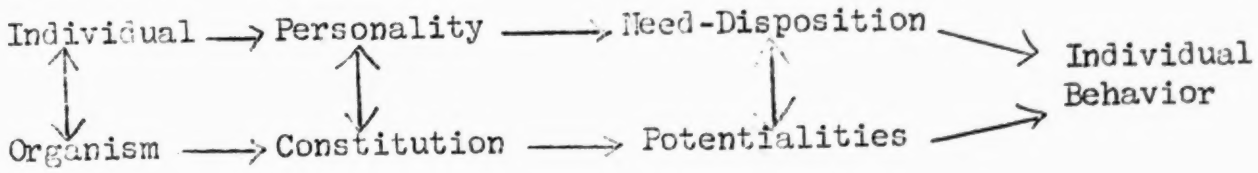
(46) Ibid., p. 68

For example, to understand students we must know the role-expectation of the student role and the need-disposition of students occupying that role. Combining the nomothetic and idiographic dimensions we have the schema as follows:


Nomothetic
Institution
Role
Expectation
Social System
Observed Behavior
Individual
Personality
Need-Disposition
Idiographic Dimension

The nomothetic axis consists of institution, role, and expectation, each term being the unit of analysis for the term preceding it. For example, the elementary (institution) school of the educational system consists of students, teachers, teacher aides, principals (roles) that are expected to learn, instruct, assist in instruction, and administer. The idiographic dimension similarly consists of terms in the same analytic unit relationship as the nomothetic dimension. For example, the elementary school composed of individual students and teachers with variations of personalities with certain need-dispositions are expected to perform in specified ways for the understanding of behavior. The nomothetic and idiographic axes represent the sociological and idiographic dimensions of the system. There are two relevant dimensions which are the biological and anthropological.

In the biological dimension the individual can be thought of in constitutional terms. Personality is part of a biological organism which has certain potentialities and abilities related to inheritance. For example, a student with a true I.Q. of 160 has the potential of absorbing rapidly large quantities of subject matter from any area of discipline he so chooses, whereas there is little likelihood that a student with a true I.Q. of 70 can become a physician. The need-dispositions of the personality are also related in some ways to the constitutional conditions. This suggests that underlying the psychological dimension is a biological dimension as follows: (47)



For example, an individual student's behavior will be understood in reference to his personality and need-dispositions as a reflection of his physical condition (organism), constraints (constitution), and capabilities (potentialities).

In the anthropological dimension the institution is viewed as embedded in a culture with certain mores and values. Role-expectations are, in some ways, related to cultural values. The institution and role of the sociological dimension are also determined by cultural values. Therefore, this is represented schematically as follows: (48)

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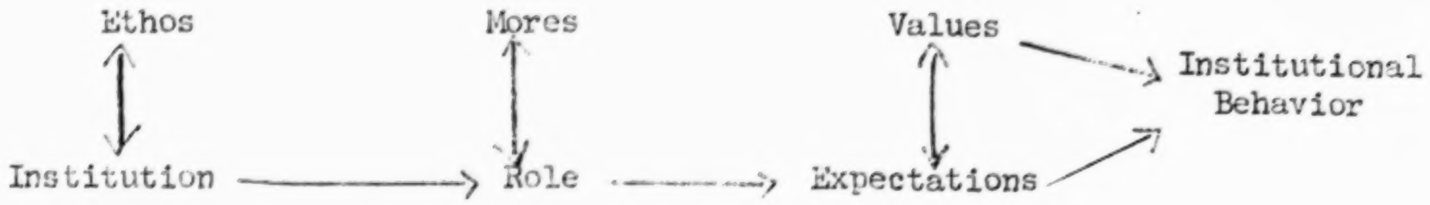
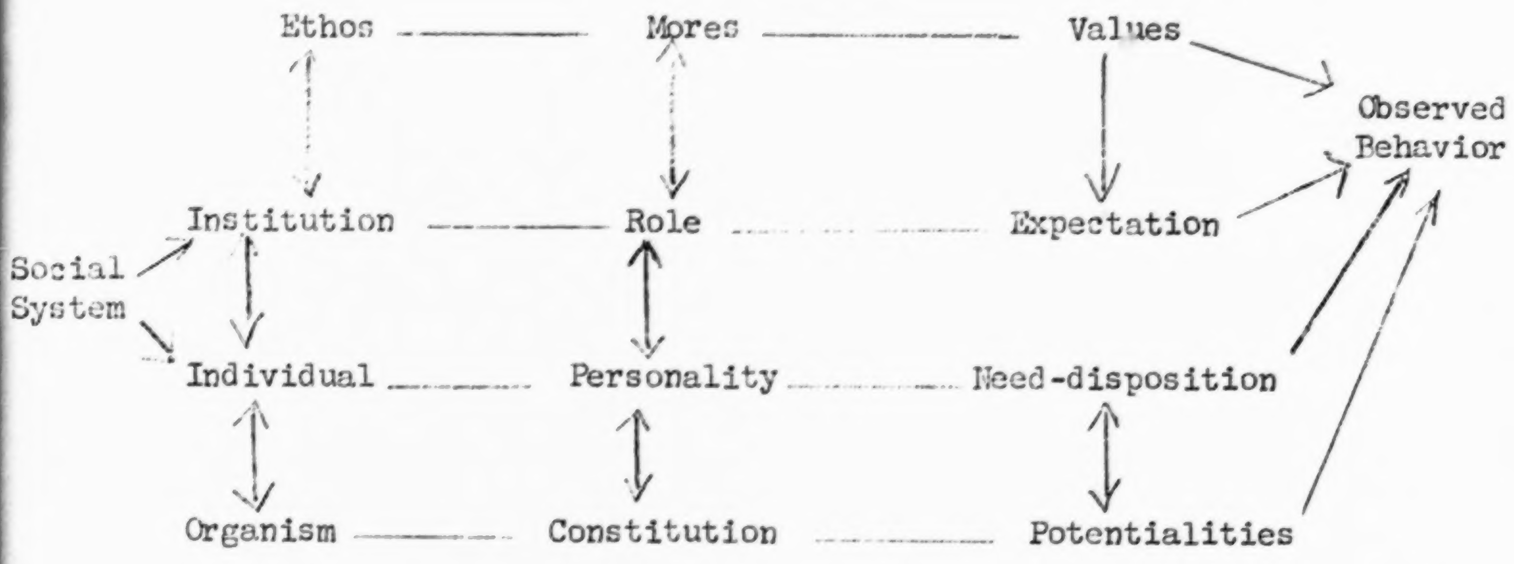
(47) *Ibid.,* p. 69.

(48) *Ibid.,* p. 72.


Ethos
Mores
Values
Institutional Behavior
Institution
Role
Expectations

All the dimensions combined into a single graphic representation are as follows: (49)


Ethos
Mores
Values
Observed Behavior
Institution
Role
Expectation
Social System
Individual
Personality
Need-disposition
Organism
Constitution
Potentialities

This model enables the educator to observe the end product of the educational system, the student,to judge the relevancy of observed behavior and reflect back on the system to isolate all points of conflict and deficiencies if the outcome behavior is not in accordance with the intentions of the system. The educational system can be broken down into its institutional components. For example, preschool, primary, intermediate, secondary, higher (junior college, college, graduate school), adult education, etc. Behavioral outcomes in this instance would be in reference to youth and adults of low-income areas. A further analysis could involve how the educational system relates to manpower requirements.

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(49) Ibid., p. 73.

Application of the Model: Analysis of a High School in a Low-Income Area

The end result of this high school social system is to graduate 100 percent of its students of which some will eventually go on to college and others will enter the labor force with a marketable skill capable of commanding an adequate income. It is known that the dropout rate for high schools in these areas is approximately 45 percent. Why?

Nomothetic Dimension of Analysis

The institution is committed to training for a vocation, assisting the student in the acquisition of skills, transmitting cultural values, providing an opportunity for mobility, assisting in the solution to social problems and serving as a source of entertainment for the students. (50) This defines the ethos.

The participants of the institutions are students, teachers of various specialties, counselors, teacher aides, principals, assistant principals, various project directors, and various curriculum directors and supervisors. The job descriptions of each, outlining the liberties and limitations, are the mores.

The expectations are the curricula and the values are reflected in what the curricula contain - causes. For example, the usual curriculum for any high school is art (including crafts), business education, driver education, English, foreign languages (French, German and Spanish), Industrial Arts, Home Economics, Health Education, Mathematics (general and basic elementary algebra, and geometry), Music, Physical Education (boys and girls), Science (biology, general physical science, chemistry and physics), and social studies. Provisions are also made for guidance and health services.

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(50) Wilber B. Brookover and David Gottlieb, A Sociology of Education. New York: American Book Company, 1964, pp. 53-65.

Idiographic Dimension of Analysis

The students attending these schools usually have great difficulty in acquiring the basic needs of food, clothes, shelter, etc. The faculty and other staff members with the exception of teacher aides enjoy a middle or low-middle income existence, however, they come from either middle or working class backgrounds. (51)

The students tend to be action oriented, preoccupied with immediate goals, not interested in pursuing knowledge for its own sake, and to possess feelings of alienation, suspicious of members belonging to other classes. The personality of most teachers represents that of the middle class. That is, emphasis is placed on achievement, ambition, striving, perspective thinking, etc. (52) It is the opinion of a number of interviewees holding some responsible position in low-income areas that these areas get the disproportionate number of incompetent, maladjusted, and discipline problem teachers. With this short description, several types of comparisons between various analytical entities of the system will be made.

1. Relationship between the role-expectations and personality need-dispositions of the student.

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(51) Robert J. Havighurst and Bernice L. Neugarten, Society and Education. Boston: Allyn and Bacon, Inc., 3rd ed., 1967, pp. 418-424.

(52) Havighurst and Neugarten, Ibid.

The student is expected to seek knowledge for its own sake. He is expected to display an interest, to be motivated to learn, show respect to the teacher, and to apply himself. On the other hand, the student comes from an anti-intellectual family situation; kindness and courtesy are viewed as a weakness or "sissyfied". (53) There is an absence of confidence in the school as a means of moving upward, and the action orientation interferes with developing a strong interest in a passive learning situation as that characterized by the school.

2. Relationship between value-expectation and need-disposition of the teacher.

Teachers in an academic oriented high school attended by low-income youth must continuously resist becoming frustrated and giving up hope. They have a strong need to realize some accomplishment. Most courses offered in combination with the traditional way they are taught offer little incentive for students from low-income areas to be stimulated. Consequently, the teacher finds himself trying to communicate with a non-responsive class. Several teachers have been heard to comment, "I'm just here for my salary, period. I maintain as much order as I can, and flunk no one. I pass them if I have to give them a D because I don't want to see the same one two years in a row". On the other hand, countless students have been heard to remark about various courses in the following way: "That course is a bop. The teacher's a bop too. What do I care about World History? Don't mean a darn thing to me." One also hears quite often in reference to a language course, "I don't see why they want a dude like me to take French.

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(53) Interview response of 12 poverty workers employed in low-income areas during the month of August.

It won't earn me a dime. That's what's wrong with this joint, it's overloaded with jive courses."

In the midst of these kinds of student perceptions a teacher is expected to get the material across. One supreme satisfaction any teacher enjoys is watching his or her students develop as a result of his (teacher's) efforts. It becomes extremely demoralizing to give a class of thirty-three a homework assignment and only seven attempt to complete it.

3. Relationship between institution and individual (students).

The school with its emphasis on training for a vocation, transmitting cultural values, building citizenship, is mainly dealing in abstractions that in most instances are misunderstood by the students. The authors have discussed the concept of citizenship or developing skills with many students from low-income families over a period of years. Such a discussion never fails to draw a few chuckles from the students. In reference to developing skills in a school setting, many a potential dropout has the following comments: "Man, I'm going to be a lawyer." Naturally, one inquires about his grades in such courses as political science, history, civics, etc. "Man, those courses are a drag, in fact I'm thinking about putting school down. I'm wasting my time." Of course, one explains to this youth that in order to become a lawyer one must complete high school, at least three years of college, and in most cases four years unless the grades are exceptional. After completing the college requirements, one applies for law school and if accepted, has three years of work before completion. The final step is passing the Bar examination. The point here is that successful completion of high school is an absolute essential for achieving such a goal. After explaining such a procedure relating to one of the professions, such as law, the authors can predict with a 100 percent probability the youth's response. It will be, "Baby, I can be anything I want to be."

4. Conflict between the role-expectation of the student and role-expectation of the teacher.

The teacher expects the student to absorb the material and be responsible for giving it back in an examination. The student is expected to raise questions when he doesn't understand, however, most teachers have some limit as to the number of times they will cover the same material. After the examination the teacher does not go over the material again; it is the student's job to correct his mistakes and learn what he missed. On the other hand, the student expects to be assisted in correcting his mistakes. The pressures of moving through the course within a specified time period does not permit, so claims the teacher, time for this. This rather serious area of conflict has remained fairly un-noticed by various social scientists and other observers. Many articulate disadvantaged high school students have replied to the authors in a very slow deliberate manner, "The teacher just marks your paper up with a red pencil, but she never tells you what's wrong with it. If I had the wrong answer and she doesn't tell me what's right, I still don't know. Man, that teacher's a bop." (Bop, as the authors understand, is about three levels below a "square".)

The model lends itself to many combinations of analyses of which four were chosen as examples.

EDUCATIONAL ISSUES AND FUTURE IMPLICATIONS FOR EDUCATING MEMBERS OF LOW-INCOME FAMILIES TO MEET MANPOWER REQUIREMENTS: A SOCIAL SYSTEM ANALYSIS

Central to any educational problem associated with members of families in low-income areas is the question, "What are the required changes that must take place in the educational system to produce the desired modification of behavior, within children and adults of low-income areas, to significantly increase the development of skills and attitudes that will subsequently lead to successful employment?"

The problem will not be completely solved by concentrating on changing one or more aspects of the educational system such as adjustments in teacher training, modifying the curriculum, introducing new teaching methods, etc., independent of the social system of which education is one of many interrelated parts. The point here is that the greatest results will be gained from instituting the kinds of changes within the educational system that harmonizes with the low-income social system and at the same time will accomplish the educational goals of the total social system, including that of meeting manpower requirements.

An examination of education for families in low-income areas through the use of Getzel-Thelen social system model offers a great deal of promise for indicating the directions of effective resolution of current educational issues over the next two decades. The model which focuses on interactions within and between the idiographic and nomethetic dimensions could provide a countless number of vital pieces of information pertaining to the future education of the urban poor, but obviously, the requirement of parsimony permits only several of them in this paper.

Educational Institutional Requirements and Participant Needs

The structure of the educational system, particularly elementary-secondary public schools, allows little, if any, participation in the decision-making process by participants beyond top administrative personnel (superintendent, assistant superintendents, principals), and the policy-making body (board of directors). Theoretically, the board of directors represents residents of the community, therefore, parents enjoy a republican form of representation. It is clearly understood that the urban poor are not organizationally prone. Thus, by whatever process the board members are selected, it's highly unlikely the urban poor participated significantly in the selection.

Secondly, the teachers of the schools have a minimum amount of authority. There is, of course, a variation in authority enjoyed by teachers within specific schools depending upon the attitude of the principal. However, the teacher's capacity to make organizational decisions is minimum at best, and non-existent at worst. In practice, principals are able to exert such a great degree of control over their specific schools that some appear almost autonomous of the total school system.

Thirdly, within the educational system there exists a great complexity of rules and regulations beginning with the manner in which the student must enter the building to the manner in which the learning material must be assimilated. The system is responsible for inculcating values and respect for those values, determined as having worth by the broader community. Thus, its natural assignment is an effort to develop traits of obedience, loyalty, respect for property, cleanliness, orderliness, etc.

Fourthly, the educational system necessarily reflects a strong air of professionalism. All employees of the system, including the teachers, are considered professionals. In low-income areas the gap between the professionals of the system and the non-professional students continues to be the source of many difficulties manifested by passive resistance, in some instances, and militant attacks, in others. Professionalism has been the holdback of various kinds of innovative features, perhaps undesirable.. Teachers have been known to resign because some idea that they felt was creative was rejected in the name of "unprofessionalism".

Fifthly, the formal school system appears to be a closed one. That is, it arranges its affairs independently of other institutions such as health, social, recreation, welfare or industry. The school(s) within the educational system,as a whole,does not coordinate its efforts.

These five points were used to identify the ethos of the institution centered around limited participation of individuals, emphasis on rules and regulations, professional characteristics, and in-group operations.

Turning to the participants of the educational system, particularly families of low-income areas, and teachers within the schools, there are needs that run counter to those of the institutions.

It is well known among social scientists that the urban poor have strong feelings of alienation. There is much evidence to support the contention that the urban poor are isolated physically, psychologically, and sociologically. The physical isolation is characterized by housing projects which are consistently built a safe distance away from middle class and upper class residential areas. Psychologically, the urban poor suffer from decisions that affect their lives but without their consultation. Sociologically, their contacts are primarily confined to other low-income families only. Therefore, one of the strong needs of the urban poor is to be recognized. To have a voice, particularly in matters related to their existence. Consequently, groups of families are forming organizations for various purposes throughout the ghettos in the nation. There are a number of citizen groups formed to check the tide of urban renewal, oppose higher food prices, to demand better housing, schools, etc.

The need for recognition by families of low-income areas can serve as a powerful friend of the educational system. There are isolated instances of this. The Head Start Project in Mississippi is enjoying great success because they have apparently discovered a meaningful way for the parent to become involved in the program. Parents were allowed to have a voice in the selection of teachers, curriculum material, rules and regulations, etc. Through this, the parents have become vitally interested in the school and, as a result, have become the chief stimulator of the students - their children. It is reported those little children learn because the parents "make darn sure they do".

An occurence in Washington, D.C., is another example of parental interest in the school as related to positive behavior. The D.C. School System spent $175,000 on broken windows last year. There is one school in the heart of the ghetto that had only three broken windows. It was found that the principal in this school has, over the years, taken a personal interest in the parents of her students through involving them in a variety of school activities as well as permitting the school to be used for various community activities. Thus, any child that is a problem to the school must face his or her parents.

A final example of decision-making power as a stimulator of the urban poor can also be drawn from a project in Washington, D.C. Project Pride was created and organized by a group predominantly composed of teenagers. The purpose of the project is to provide employment for unemployed urban poor teenagers. The project is operated by professionals under the authority of a board of directors controlled by these teenagers.

These three cited projects and others similar to them illustrate the potential of the urban poor in overcoming their educational and employment problems if the educational institution is willing to relax many of its traditional needs to capitalize on that potential. All these projects have one exciting feature in common, they were the bases of a breakthrough for the urban poor. They pulled the internal strength from these people, a strength whose fire is kindled by a need for recognition.

Teachers have also a need to be recognized. A need to have some power to determine the course of action in his own classroom and the school in general. This is particularly true in schools located in low-income areas because the set methods and techniques are not yielding results. The teacher's desire to experiment is seriously hampered by a set curriculum, detailed procedures, and an army of consultants. One teacher remarked that she is with her class for a total of two hours the entire day; the remaining time is taken by various experts and consultants. Teachers naturally feel that they should be the focal point around which revolve their classes rather than be reduced to a lower status by a variety of experts dealing with the classes. This need is complicated by the teacher's feeling of inadequacy in training. The vast majority of teachers in the urban poor areas would like to have had more sociology, anthropology, and psychology courses than they received. They refer to those schools of education with such training as having "sound teacher training programs".

There is also much to be gained in analyzing the conflict between the educational institutional needs and those of students from low-income areas. For example, most high schools are set up on a four year basis with classes running approximately five and a half hours per day, discounting lunch. Many of these students, especially boys, must also work to help support the family. Some are employed full time at night and attend school all day. These children are too tired to gain much from school. Many sleep in class or drop out of school. The question is raised as to why it is necessary for a high school to be established on a four year basis. Why could it not be established on a basis not specifying the exact number of years for completion. Some could complete the training in four years, others in five, and perhaps others in six years.

Institutional Role-Expectations and Personality Needs

Within the role-expectation of teachers and personalities of teachers, there are possibilities of great conflict, oftentimes magnified within the schools for the urban poor. How some individuals become teachers is general knowledge. Many times the teaching profession was second choice. Any professor in a school of education can cite numerous examples of students referred to the school of education by psychology or sociology departments. A rather frequent response to a psychology dropout is "Why don't you apply to the school of education, you can become a teacher with a major in educational psychology". The end results have been there are far too many teachers that are teachers because this appeared to be the easiest major to complete.

To be an effective teacher requires a given set of potentialities. Just as anyone cannot become a physicist or psychologist, neither can anyone become a good teacher, particularly in the ghetto school.

In urban poor areas, teachers must possess a high tolerance level, non judgmental, lacking in ethnocentric characteristics, etc. Such variables supersede those of I.Q., high grades in college and intellectualism.

Schools of education must identify the important personality characteristics for the successful teacher that may be at variance with those of selecting students for other professions.

The role of student and the personality of students from low-income areas have many points of incompatibility also. For example, the passive role required of the students in the system is at odds with the students' emphasis on action. The proper image in expressed language, dress, and behavior does not correspond to the value system of the urban poor youth and adult students.

Summary

Assuming that progress, over the next twenty years, is successful in providing the urban poor with intellectual and marketable skills, it will do so through instituting measures that are in agreement with the urban poor's life style. For example, decentralized school systems will give families from low-income areas greater decision-making power, nongraded schools will remove the kind of structure rejected by them, urban education teacher training programs will provide teachers with the kinds of skills, knowledge, and attitudes needed to deal with the urban poor, and the curriculum material will reflect a life meaningful to the students rather than specifications of professionalism. These are the kinds of considerations that serve as the foundation of predictions cited in the next section of this paper.

PROBABLE DEVELOPMENT IN EDUCATION
FOR LOW-INCOME FAMILIES
OVER THE NEXT TWENTY YEARS

It will require a gigantic coordinated effort by local, state and federal governments to reverse the demoralizing life experienced by residents of low-income areas. The educational system cannot alone accomplish this task, but it can contribute sugnificantly to such a goal by overhauling its own and by recognizing its relationship to other societal institutions also indispensable to human groups.

In the case of low-income areas, the educational system must pay particular attention to the needs of the economic system. An increasing number of professionals working with the disadvantaged are concluding that jobs are the answer. This immediately triggers a set of ordered reactions of which the former must be satisfied before the latter can be accomplished. It runs like this: to get a job, one must be skilled; to be skilled, one must have had some training; to receive training, one must be able to read and write; to learn to read and write, one must be motivated; to be motivated, one must be exposed to content and material relevant to his life experience; and to include educational programs relevant to one's life experience, that life experience must be understood.

The critical question in this section is, what are the potentialities of the educational system to spring members of low-income areas in sufficient numbers from their unfortunate plight? One manner of discerning these potentialities is by attempting to read the signs of change within the nomethetic and idiographic dimensions of the educational system and predicting the magnitude twenty years hence. Application of the Getzel and Thelen model will be used for this purpose:

1. The gap between the institution's role-expectation of the student and the student's personality need-dispositions at the secondary level of education will be considerably closed.

Disadvantaged high schools across the country are turning the heat on their respective administrations. They are not only demanding such things as better food, updated equipment, but also current text books, better qualified teachers, Negro history and language courses, and other courses - such as - advanced mathematics, physics, etc., that are offered in other high schools of the same district but serving middle class students.

Some of these students are beginning to replace the press as the chief complainants of high schools in their areas, turning out graduates barely able to read and write. Student groups have been formed and given themselves names, such as the "Modern Strivers". These groups do not hesitate to challenge the authority of the principal or teacher. They will instigate all forms of civil disobedience, and sometimes violence, among the general student body.

This type of student pressure has forced the high school to reexamine and alter many of its deeply rooted values. The student can no longer be viewed as a passive participant of the system but his thinking must be taken into account in making decisions. This is evidenced by the willingness of the school administrators to negotiate with representatives of these militant student groups.

There are signs that this student influence will grow over the next twenty years to the point where there will exist a representative body of permanent stature having influence in school affairs. We have already seen students use their influence to dismiss a teacher in Los Angeles over the administration's objections and to prevent the dismissal of another teacher in Washington, also over the objections of the administration.

Thus, it is predicted that high school students of low-income areas will accept the schools' demands as related to their individual needs because they will have gained partial rights to determine the nature of those demands.

If this development does not occur, because the school is able successfully to resist the trend, then in 1988, we will see other structures competing with the secondary school in education. This would be inevitable if the school holds on to its traditional view of the student, since dropouts, apathy, and disruptions would increase disproportionately, something which no community can tolerate much longer.

2. There will be realignment of the institution's value-expectation and the teacher's need-disposition.

The teacher has been viewed by the school as a transmitter of information only. Usually he is provided with a curriculum guide and given general instructions on what to teach by others of the educational system who are not teachers. The teacher is expected to accept direction from the principal, curriculum supervisors, and directors, along with their respective assistants. To compound this situation, teachers have suffered a loss in status in the community at large since World War II.

The teachers, in recognition of their unfavorable position within the school, are also beginning to organize and become militant toward the administration and school board. This is characterized by the 1966-67 strikes in areas such as New York City, Pittsburgh, Montgomery County, Maryland, East St. Louis, Illinois, and Florida and others. They are not only striking for higher salaries but also for acknowledgment in academic affairs. The competition between local unions and NEA affiliates will contribute to a stepped-up pace of teacher action.

Teachers are beginning to introduce materials in their classroom which are not sanctioned by the administration. The incidents are becoming more frequent of teachers using material they feel is more appropriate for their students, even if undesirable four-letter words are contained in the study material.

3. The training of para-professionals will have become valued as a major goal of the educational system.

It will be in the training of the para-professional that the educational system will enjoy one of the closest ties with the economic system. The combined effort will have the net effect of directly reducing poverty.

In the areas of housing, health, welfare, recreation, public safety, etc., problems are mounting and there simply are not enough professionals available, or graduating from schools, to fill the available jobs. For example, the magnitude of the social problem and the indication of need for additional trained personnel can be seen from the situation in the District of Columbia. In the District, slightly more than 17 percent of all families (30,077) had an income of less than $3,000 per year. Of these families, 68 percent were receiving A.D.C. grants of less than $2,000 per year.

In housing, there were, in 1966, 45,000 overcrowded housing units, and 25,000 housing units deteriorated beyond the point of rehabilitation. The National Capital Housing Authority estimates there are 43,000 families eligible for public housing, yet a total of 11,000 housing units will be available by 1968. (54)

In public schooling, one sixth of the total elementary school population attend schools erected before 1900. Eighteen percent of these are in classes with 36 or more children. Half of the entering high school students do not complete high school. In 1961, 17 percent of women bearing children received no pre-natal care at all. At the Children's Center, operated by the Department of Public Welfare, 80 to 100 youths at any given time are ready to leave but have no place to go. In 1963, 2,965 children were committed to D C. institutions. Of these, approximately 1/3 were committed for delinquency, and 2/3's for dependency of which 25 percent were under three years of age.

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(54) Community Renewal Program, D C. Report to the D.C. Commissioners, 1966.

The two preceding paragraphs indicate the need for more professionally trained persons to work in Washington, D.C.; situations which are more than likely typical of most large cities. Where are we going to get these trained persons?

In 1960, there were 105,000 persons employed in social welfare positions in the U.S.A., in 1966, the number was estimated to be 125,000. (55) The available pool of social-work manpower with professional education is less than 40,000 persons. (Personnel needs are expected to increase substantially in every professional field.) Since 1960, more than 50 pieces of legislation having an impact on manpower demandshave been enacted. Today, an estimated 12,000 established positions for qualified social workers are unfilled. For programs in which agencies in the Department of Health, Education and Welfare are directly concerned, 100,000 more social workers with full professional education will be needed by 1970. (56) Areas in which trained social workers will be needed are (1) state and local public family welfare agencies - 95,000 by 1970; (2) counties with no welfare workers - 1,200; (3) probation and treatment facilities - 11,000; (4) specialists in social work services to the aging, one in each of the 3,200 counties; (5) school social workers - 17,000; (6) mental health centers - 7,500; and (7) voluntary agencies' projects - a need of 4,500 more workers by 1970. These are the needed professional, trained social workers; but the question is, "Where are we going to get them?" The same point and related set of statistics could have been cited for other disciplines, such as, nursing, teaching, engineering, etc.

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(55) Washington Action for Youth, Board of Directors on Juvenile Delinquency.

(56) Public Welfare Crisis in the Nation's Capital, National Association of Social Workers, 1962.

The experience of the anti-poverty program and of the program developed under the Office of Juvenile Delinquency, under the Elementary and Secondary Education Act, Office of Education, have demonstrated the usefulness of employing residents of low-income areas as aides in various social and health welfare services. This experience in successful use of poor people as auxiliary personnel, coupled with the shortage of professionals just described, has led many agencies across the country to redefine jobs into functions that can be performed by people holding less than college and less than high school diplomas.

> "The growing recognition of the variety of social tasks, the increasing possibility of defining tasks and identifying and developing social welfare content in educational programs below the master's level, the expansion and potential of in-service training--all forecast improved social services. The recently authorized 'two career lines' in the Bureau of Family Services, DHEW, and new and experimental staffing patterns in many volunteer agencies are attempts to foster this improvement, hold career interest of new recruits, and use appropriately the contribution of people with differing educational backgrounds." (57)

In the field of education the same attempt is to redefine the role of the teacher and use the talents of neighborhood aides as auxiliary personnel. In New York, excluding New York City, 68 percent of school districts are using school aides; 300 teacher aides are used in Washington, D.C.

The educational system will not be able to avoid accepting the aide category as legitimate and useful, discounting the potentialities for employing residents of low-income areas.

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(57) National Commission of Social Work Careers, 1965-1966 Fact Sheet.

The training is already being undertaken by a variety of educational institutions, including projects supported by anti-poverty funds. In some sections of the country, universities have taken the leadership for developing educational programs for aides in human services. Arizona State University has a program for workers on Indian reservations; the University of Denver, for training the poor for non-professional jobs in public and private agencies. East Carolina College is training aides to work in a day-care center, New York University is training teacher aides, and Washington University of St. Louis, Missouri, is offering a one-year certificate in community development.

4. The curriculum reform movement of the elementary-secondary schools of the educational system will have been completed.

Values of the society at large are theoretically reflected in the curriculum of the schools. Of course, the curriculum is what is taught. This raises a series of questions related to priority, because the knowledge explosion has made it impossible to teach everything. It also raises questions as how should that which has been decided to be taught, be taught?

Goodlad's five curriculum orientations can be identified over the past 40 years. (58) In the 1930's, it was child centered; in the 1940's, society centered; in the 1950's and 1960's, discipline centered; and in the 1970's, a "total" curriculum for all children will be the approach. Dr. Goodlad predicts we will have a humanistic curriculum by the 1990's.

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(58) John Goodlad, "Direction and Redirection for Curriculum Change", Curriculum and Change: Direction and Process. Washington: Association for Supervision and Curriculum Development, 1966.

Sand thinks that "Phase One" of the curriculum reform movement has been completed. Academic scholarship was its primary focus, placing stress "on the structure of separate disciplines, on comprehensive packages of instructional material, and on in-service training of teachers". (59) He goes on to say "Phase Two" must include pedagogical scholarship comparable to that of academic scholarship in Phase I. It must also be viewed as a whole and not divided into pieces, but prove attractive and meaningful to all students -- bright and dull, highly and poorly motivated.

We are beginning to see emerge a type of curriculum commonly called the "organic curriculum", which seems to have promise with youth and adults from low-income areas and which is being tested outside the formal educational system. The organic curriculum attempts to provide the student with academic skills while training him to develop some practical skills. For example, the student learns to read, write, and figure in the process of learning the skills of an electrician, programmer, office worker, etc. Such a method brings the theoretical material, the use of which is always questioned by the disadvantaged, into focus with the practical application. Thus, abstraction and perspective, two de-emphasized values of the urban poor, are accounted for in what is taught. This type of approach has been popular among the OEO-supported work-training employment centers around the country. The ones located in Washington, D.C., and Philadelphia, have enjoyed a great deal of success in the training and placement of their graduates.

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(59) Ole Sand, an address, "Schools for the 70's: Opus Two", before the Annual Meeting of the Department of Elementary School Principals, NEA, Boston, Massachusetts, Tuesday, April 11, 1967.

As the curriculum reform moves further into Dr. Sand's Phase II and toward Dr. Goodlad's humanistic orientation, it will reflect more training in social relations, which are vital to youth and adults from low-income areas. There are those from low-income areas who have marketable skills but experience difficulty in their social relationships with employers and fellow employees. Arriving to work on time, holding absenteeism to a minimum, being willing to accept authority figures, being able to accept criticism and kidding from fellow employees are all part of gainful employment. Some provision must be made for considering these social aspects of employment in "what is taught" to youth and adults in low-income areas.

5. The educational system will be composed of a variety of structures within the formal system and more responsibility for job training will be undertaken by structures outside the system.

It is too early to predict which over-all organization of the educational system will prevail by 1988. For residents of low-income areas, particularly Negroes, this outcome will depend upon social forces over which the educational system has no control. It is inevitable that it will be either educational parks or decentralized school systems, but very probably not a combination of both within the same school district.

The dispute over segregated vs. integrated education is directly involved. Resolution of this matter will determine the over-all organization of the school system in a particular locality. Decentralized school systems are in harmony with segregated schooling and educational parks with integrated schooling.

Segregated schooling should not be associated only with the intentions of conservative white people of this country. If we read the Black Power movement correctly, it also has the blessings of the Negro militants. Black Power must not be interpreted by its opponents as a fad that will pass away as thousands of other fads have done. If it does disappear, it will be because the conditions that gave rise to it will have been removed. Black Power is not simply a current event. It has roots in the past under other labels, and will branch into the future if the educational system and her sister societal systems do not intercede.

Black Power's central position is that Negroes should not move out of their segregated neighborhoods but should remain and take control of the social institutions governing them. These include politics, economics, and education. Consequently, the schools are under fire by the card carriers and sympathizers of Black Power. Student groups such as those under various Black Power committee labels are forming inside the schools. Members of these groups are as impatient with middle class Negroes, whom they refer to as "Uncle Toms", as with white people commonly referred to as "Chuck", formerly referred to as "Mr. Charlie". In the meantime, the adult faction is barnstorming the Boards of Education and key administrators of the schools. Only very recently a leader of the movement announced their intentions were to get control of the schools in Washington. Decentralization of school districts could be an official way to bring about that control.

One word about the influence of Black Power. The most important thing is that the militant Negro organization's influence should not be underestimated among low-income Negroes and, to some degree, middle class Negroes. Negroes residing in low-income areas are not by any means ashamed of Black Nationalist groups. As one young Negro said to the authors, "I like Mr. Muhammed and Rap Brown because they have principles". The strength of the Black Nationalist's groups, particularly Black Power, lies with its ability to (1) make the poor Negro feel he is somebody (development of self-concept in psychological terms), (2) pull the middle class Negro closer to the poor Negro (cohesion in sociological terms), and (3) make Negroes feel there is some value in their historical development (culture in anthropological terms). This does not mean there are not, perhaps, weaknesses of equal magnitude in the movement. But, upon asking the Black Power leaders if they have always been faithful, they answer, as Captain Lignon's wife replied to him, "frequently".

The over-all educational structure pushed by integrationists has been that of educational parks and open school policies, etc., in order to balance the races of children attending public schools. The concern here has been, not only the inequality of education, but also an underlying belief that the Negro child will learn more and perform at a higher level of achievement if he is attending schools with white students. At the same time, it is believed the balancing of Negro and white students does not impede the progress of the latter. The proponents of these ideas are more comfortably placed in the power structure than with either the Black Nationalists or the White Conservatives, both of whom advocate segregated schooling, although for different reasons.

Whether in 1988 there will be predominantly integrated or segregated education in urban low-income areas depends upon the struggle between the integrationists and separatists. The pattern will probably vary between metropolitan areas. For example, in those areas where the central city is almost totally Negro, it will require acceptance of residents in the outlying incorporated suburban communities before a balance of races in the school will be possible through educational parks or bussing. If residents will not agree, then it will require action by the state legislatures through the enactment of law. Both resident approval and state action are difficult to attain. Many residents move to the suburbs to get away from the central city problems in the first place, and a large number of state legislatures are composed of representatives put into office by suburban residents who form the constituency of these representatives.

At the extreme end of the continuum, there are experts in education and behavioral sciences who believe the only solution to the education problem of low-income children is to establish residential schools and accept the students on a voluntary basis. Negro and white children of all socio-economic levels would be in such a school. The parents would voluntarily enroll their children, thereby circumventing the strict laws against involuntary placements. If all else fails, we suspect by 1988 such experiments will be underway.

It is safe to say, that by 1988, the internal organization of the school and classroom will have been greatly modified. As the experience with the use of nongraded classes and schools increases, as well as the successes with the use of educational technological materials and equipment, some impact on the total educational system will have to take place. The success of projects in New York, Greeley, Colorado, and Chicago is expanding and cannot be ignored. (Representatives of the company providing the equipment to the New York project have said their company is ready to contract with public schools and to guarantee that so many children will be able to read at a specified grade level upon completing the company's course.)

Nongraded classes and educational-technology-based material and equipment lead into individualized instruction, an approach gaining a great deal of momentum. Duluth, Minnesota, leads in this area in that it has incorporated an individualized instruction approach throughout its school system. Basic to this approach is the idea that every enrolled student is operating in all subject areas at his individual level of understanding. He moves to the next level of instruction in each subject at his own rate of speed and not by the group's. In reference to homogeneous groupings, there are as many tracks as there are students and each student occupies his own track. The materials, methods of teaching, equipment, etc., are selected in accordance with the student's needs and capability of functioning.

Any of the basic methods underlying individualized instruction requires a considerable change in the role of the teacher. The teacher takes on functions of a classroom manager as well as a transmitter of information. He must be capable of deciding what the learning deficits of the student are and know how to select and sequence the appropriate materials. He must know at what point the student is ready to move forward and, lastly, for maximum effort he must be able to advise those responsible for constructing the material and equipment.

Unquestionably, by 1988, the educational system will be sharing its responsibility for training and education with agencies and institutions other than schools. The beginnings of this movement are beginning to appear. In addition to the job-training efforts supported by OEO, the Labor Department, and to some extent the Commerce Department, industry is beginning to examine seriously its commitment to training residents of low-income areas. President Johnson convened a group of prominent business men in January of 1968 to ask their help in job training. Such companies as Ford Motor Company are in the process of constructing a job-training program.

Industry is beginning to combine its efforts with low-income-area community organizations for job-training purposes. In Washington, there has been an alliance between a local group and an industrial group which calls itself Fairchild-MICCO. Fairchild, the company, is putting a plant in a poor neighborhood, composed of MICCO residents, to train the residents in that neighborhood in a variety of job skills. The residents will be able to buy shares in the company. After a period of years, the residents of the area are to own and operate the business. In the coming years there will probably be many other creative ways in which industry will involve itself in the training of residents of low-income areas.

Another manner in which job training will take place outside presently accepted educational boundaries is with projects created by people of low-income areas familiar with the needs of their neighbors and who know how to formulate training programs to meet those needs.

In Baltimore, Maryland, one of the women skilled in sewing started a sewing school for her neighbors with two sewing machines. (There is a great demand for seamstresses in Baltimore.) She has been so successful that her enrollment has jumped from two students to sixty and is supported by the Vocational Rehabilitation Department of the State of Maryland. Intentions are to expand the school, now known as The State of Maryland Industrial Sewing School, to accommodate 170 trainees.

The strength of this program lies in its capability of recruiting, holding, and training women from low-income areas and in placing them after they have been trained. Follow-up evaluations have revealed employers are extremely satisfied with the work of the graduates.

Finally, by 1988, there will probably be a different set of criteria to judge the qualifications of residents from low-income areas for jobs. Some businesses, instead of giving written tests to determine the qualifications of applicants, are establishing a so-many-months trail period and then determining their capability. If this practice becomes widespread, the enormous amount of time, energy, and money expended on training applicants how to take tests and behave in interviews can be suspended. If there is no change in the manner of judging applicants' qualification for industry, then an increased effort in the education of applicants on how to take tests will be needed.

6. The educational system's role-expectation of teachers working in low-income areas will correspond to the values and needs of low-income area residents, thereby having an impact on the requirements for teacher training.

In 1988, the majority of teachers working in low-income areas will have been graduates of urban education programs of universities rather than from the traditional elementary or secondary education programs.

Already we are seeing a movement away from the types of college teacher-training programs with a heavy loading of teacher methods courses. (Incidentally, temporary college teacher-training programs designed specifically for training teachers to work in low-income areas are beginning to stimulate change in their permanent teacher-training programs.) Substitutions for methods courses are such courses as Urban Education, Introduction to Special Education, Learning Disabilities, The Deprived Child, etc., accompanied by a one-fourth- to one-half-time practice teaching. There is an ongoing integration of theory from the courses with practice in the classroom. The literature is beginning to suggest that practice teaching may be the most important component of teacher training.

A review of some twenty five teacher-training programs for teachers of low-income areas reveals that all have one or more of the following kinds of objectives:

1. To provide a sound understanding of the social, economic, political, and cultural conditions of the disadvantaged persons.
2. To provide a clear understanding of social stratifications, the culture of poverty, the psychology of disadvantaged persons, and the impact of the city on the lives of disadvantaged persons.
3. To provide a clear understanding of the nature of social organizations and the relation of such organizations to disadvantaged persons.
4. To provide the student with the basic knowledge of the organization of schools, constitution of the curriculum for disadvantaged children, and to provide opportunities for acquisition and development of selected teaching skills.
5. To provide students with sufficient understanding and competence in team leadership and intern supervision to enable them to function in the capacity of educational leaders.

In 1988, some of the graduates of programs with such objectives will have become supervisors, principals, and superintendents and will be in a position to influence the recruiting and hiring of teachers to work in poverty areas.

The 60's mark the beginning of training these special teachers, with special skills and knowledge to work in low-income areas. Will this small seed grow into a small or large tree or will it wither and die? There are signs that the movement is gaining momentum, again due to the efforts of the federal government.

On June 29, 1967, the Education Professions Development Act, Public Law 90-35, was signed by the President. This law combined many of the programs of previous legislation and added new ones for teacher education. It extended the Teacher Corps for three more years and increased the funding to improve the quality of teaching and to help curtail the shortages of trained educational personnel.

Public Law 90-35 contains five parts which grant funds to state, local, and/or institutions of higher learning and other public and non-profit agencies, for attracting and training a wide range of educational personnel.

Part A. $2,500,000 authorized for fiscal 1969 for attracting qualified persons in the field of education, among whom would be youth in secondary schools identified as capable and interested in a career in education.

Part B. $46,000,000 authorized for fiscal 1969 to continue the Teacher Corps Program, and $50,000,000 for states to help communities with a critical shortage of teachers as well as to obtain the services of teacher aides.

Part C. $205,000,000 authorized for fiscal 1969 to institutions of higher learning for fellowships for teacher and related educational personnel. This would include teachers of pre-school, adult, and vocational education along with those in elementary and secondary education.

Part D. $70,000,000 authorized in fiscal 1969 for improving training opportunities for personnel in programs of education other than higher education. This would include the training and retraining of teachers, teacher aides, guidance and counseling personnel, preparation of teachers to meet the special needs of the socially, culturally, and economically disadvantaged, etc.

Part E. $21,500,000 authorized for training programs for higher education. These are funds to help institutions of higher learning prepare college and university teachers.

This brief explanation of the Education Professions Development Act, which follows the Elementary-Secondary Education Act and the Higher Education Act of 1964, certainly contains, among other things, the idealistic national commitment to deal with the education problems of low-income areas. The Act has already been translated, in part, to practice. It is inconceivable that this movement will not continue during the next two decades and have a profound impact on the kind of teacher found in the inner-city school by 1988.

Complementing PL 90-35 are other federally supported teacher-training activities under OEO and NDEA institutes. We can be sure that institutions applying for federal support for training educational personnel for low-income areas must demonstrate in their proposed programs an inderstanding of the educational needs of the socially, culturally, and economically handicapped. In addition, they will have to show an ability to execute their teaching programs so that the student upon graduation will be capable of handling these special kinds of problems. This will then provide the educational system with the talent it needs for the low-income areas, which leads to the seventh and final prediction.

7. Residents of low-income areas will have a major role in the decision-making process of the educational system.

Parents are beginning to demand and gain recognition from the school system of inner-city areas. They are basically concerned about what they feel to be inappropriate values of the educational system. Their children are not learning, and parents know it. Many of them have expressed the opinion that the schools are preparing their children for a life of sadness equivalent to their own, "No job, no decent place to stay, always in a tight spot." They are impatient with the attitude of the educational personnel and the school board. Thus, in the early 60's, we began to see formation of pressure groups of low-income families petitioning school boards and educational officials for various kinds of personnel and curriculum changes. Superintendents of inner-city school districts are now beginning to form parental advisory groups. Most of these groups at the present time have no real power because "the superintendent and the rest of those folks go on and do what they want to, anyway".

By 1988, these advisory groups will be advising. Why do we think so?

First, the rise of community schools was based on the very important assumption that the school should not only become a focal point of community activity but also that the residents (parents) should be a part of it. For the parents to be a part, they had to be involved in making decisions. This outlook has established the precedent for the highly trained educational personnel accepting as equals poorly trained adults in the decision-making process. An extension of this has been a plan, aided by foundations such as Ford (which is very much interested in supporting community schools), whereby residents of the neighborhood have complete control through a board of directors.

Second, we think we discern an attitude among parents of low-income areas that, although the principal and teachers are the child's chief educators, "the parent is still the parent". Schools are made for the children; without them there would be no school and no need for teachers and principals. Therefore, if the school does not listen to the parents, then the children will not attend. "They can't learn any less staying home." Keeping the children at home, although illegal, is a new weapon talked about, at least, by parents. It is hard to see how the schools will be able to avoid "letting the parents in on the know" if parents decide to exert this type of pressure.

Third, the poverty program has written into law that a certain number of members of the board of directors and advisory boards must be members of poor families. This four or five years' experience has had the effect of destroying much of the poor man's previous fear of educated people. They have had an opportunity to see educated people as human beings subject to bungling as badly as anyone else. As one middle-aged unemployed man said to the authors, "I didn't know so many people with B.A.'s, M.S.'s, and Ph.D.'s could be so stupid. I may not have no schooling, but I'm not stupid." Perhaps among the poor, it has begun to be recognized that college degrees very often indicate a level of status rather than a measure of knowledge about a subject, particularly poverty. This is something the middle class has suspected a long time. Anyway, the approach of the poverty program has had some effect in removing the barrier between the poor and the professionals, a barrier primarily built on feelings of inferiority among the poor. Consequently, there are those of low-income areas that are unhesitant in demanding the school to take account of their thinking.

Addenda

The predictions of this section, and indeed the material throughout the paper, take into account only two of the four important social systems at work. The two omissions are the family and the community, both of which are interacting with education and employment. They were omitted in part because they are the essential ingredients of another paper by Dr. David Ruth, and in part because of the authors' total concentration upon the relationship of education to employment.

It is recognized that certain types of changes within the family and/or community could modify or make null and void the authors' expected developments in education and could improve the employment picture for the residents of low-income areas. Three examples are used to illustrate the point:

1. If a strong federal housing law is enacted and residents of low-income areas are distributed throughout a metropolitan area, then the entire teacher-training picture and organization of curriculum and school will have been estimated incorrectly. Secondly, if middle class and upper class people move back into the inner city in the '70's with the same degree of rapidity as they moved out in the '50's, again, the educational picture in 1988 will be different from that predicted.

With respect to this point, the authors cannot see even a strong open housing trend altering the neighborhood pattern significantly in the next twenty years, because the need for an appreciably higher income for poor residents would be needed in order to live in those areas. Neither can the authors see signs of change in the Congress for rent supplements to bring this about. Finally, judging from the attitude of suburbanites at this time, in conjunction with the amount of time required for social attitudinal changes, neither can the authors see a mass return to the inner city by 1988.

2. If a guaranteed wage or guaranteed job program is enacted into federal law, the picture of the community and family systems will also

be very different from that predicted. In either case, the emphasis on on-the-job training and retraining would be very great by 1988.

3. If, within the next 10 years, the motivation of youths and adults in families of low-income areas is internal to the family, then many of the external stimuli built into the organization and approach to education as predicted will be invalid.

In conclusion, it should be stated that the symptoms of many very different diseases are the same; yet, to determine the ingredients of the medicines to be used as remedies, before all the symptoms have had time to appear, is dangerous.

IMPLICATIONS FOR THE ACTIVITIES OF A CENTER FOR POLICY RESEARCH IN EDUCATION

The multiplication of approaches and educational and employment services for low-income areas, in many instances, are desirable. But the duplication and lack of coordination between these approaches and services is confusing to the variety of agencies and organizations in the field. These agencies and organizations providing the services with their specialized staffs and methods are not only hampered in their communication with the low-income family area, they are hampered in their communication with each other. Good communication, of course, is indispensable in effective education and employment planning for the deprived.

The confusing services combined with a common lack of knowledge as to what exists results in many families of low-income areas not getting the help they need. An educational policy center could be of great help in encouraging appropriate educational and employment agencies to gather and submit the following baseline information:

a. The variation in level of education among the unemployed in low-income areas.

b. The occupational categories vocational and technical training schools should include in their program. The occupational categories that should be deleted from such training programs because they will become obsolete or because there exists no manpower requirement.

c. The cost and time of training individuals of specific age levels for specific occupational categories.

d. The disposition of graduates of the various training programs. This information would enable the policy center to determine which institutions conduct the most effective training programs in relation to specific occupational categories.

The chief purpose of the Center would be to evaluate the consequences of educational public policy for employment. For example, the impact of HEW and OEO education programs for improving the employment picture of the poor.

The Center would be gathering data and disseminating data between the employment and educational system, thereby establishing lines within and between the two systems. (Information related to the various materials, methods, and approaches used and the effectiveness of each would also be an appropriate function of the Center.)

The net effect of this baseline data gathering and disseminating would assist the education and employment institutions to reduce the multiple and conflicting approaches in the development of skills experienced by members of low-income families seeking help. Many low-income families bitterly resent the "multiple services" situation. We suspect a great deal of a community's already limited resources are wasted because of the hostility of the families to their organization. However, this suggested institutional integrating mechanism employed by the Center will not be enough. There are two other important objectives: (1) to stimulate a wider range of institutional participation in the educational and employment problem of low-income families, and (2) to stimulate additional programs, services, and co-ordination of programs for this same group.

Stimulating Institutional Participation.

1. To encourage educational and employment agencies to diagnose the specific needs, values and resources of their service areas and thereby, determine time phasing, goals and operations of their program and its relationship to other programs in a total concerted effort.

2. To support existing organizations, or to foster new ones, that will work more effectively to secure changes in policy and programs needed in their service area.

3. To establish advisory committees composed of employment specialists and educators as a channel for inter-communication and joint decision making.

4. To provide educational and employment agencies methods for improving their programs on behalf of low-income families.

Stimulating the Improvement of Programs, Services and Coordination.

1. To assist the staffs of educational and employment institutions in understanding effective strategy by their involvement in diagnosing the particular needs, values, and resources of their service areas.

2. To increase within and between the staffs of these two systems, the degree of communication and shared concern for more effective communication and concern for an integration of services and programs, to increase their knowledge of, and identification with, their service area.
3. To encourage the organizations to increase the accessibility of new and existing resources and, thereby, stimulate a more appropriate use of them.
4. To encourage the organizations to identify and provide services and opportunities to those individuals of low-income areas who are reluctant, for various reasons, to utilize the opportunities that are available.
5. To encourage the educational and employment agencies to eliminate inappropriate functions and, more importantly, inappropriate personnel attitudes.
6. To facilitate the effectiveness of programs by persistently encouraging educational and employment agencies to develop specific educational and employment programs to meet the real needs of low-income families.
7. To assist in the coordination of the implementation and operation of educational and employment agencies concerned with the low-income area.

On-the-Job Training.

On behalf of the low-income families, an educational policy center would be of great assistance if it provided leadership in the development, with the cooperation of management and labor, projects for on-the-job training, particularly for youth 16-22 years of age. After being initiated, the general supervision of such projects would be under the supervision of labor or management or a third agency designated by the policy center. Such projects would take two forms; one, in business and private industry, and two, in corporation-sponsored enterprises.

1. In business and private management -- Training could be provided in fields certified by the State Employment Services as having jobs available, for example: clerical, health, auto mechanic, spray painter, plumbing and electricity. The trainee could enroll for a specified period of time with the possibility of renewal for another specified period of time. The policy center could attempt to locate funds to reimburse employers for the training cost.
2. In corporation-sponsored enterprises -- The Center could provide the appropriate agencies with the "know how" and "show how" in helping individuals of low-income areas in establishing on-the-job training enterprises such as restaurants, furniture shops, filling stations, etc. The enterprise would be under the supervision of a neighborhood educational or employment agency. Youth of the low-income areas would be trained under the supervision of union instructors, skilled in theirrespective fields. The trainees could be paid an hourly wage while in training.

In addition to the baseline information gathering, stimulation and dissemination described role of a policy center, it could also serve as a kind of ERIC for the educational-employment dimension as related to the low-income areas, i.e., evaluating data on all educational and training programs designed to develop the skills of individuals from low-income areas. This type of evaluative data used in conjunction with the baseline data would enable the Center staff to formulate intelligent guidelines for effective training and planning.

Toward Establishing an Educational Policy System.

The first step in carrying out the activities of the Center would be to organize two divisions: one, an Institutional Relations Division, and two, a Central Information System.

The staff of the Institutional Relations Division would be responsible for contacting and establishing relationships with the complete range of governmental (local, state, and federal) and private programs and projects of institutions in the educational and economic systems having some degree of commitment to the development of basic skills. Identification of these institutions and projects would be a large task in itself.

The Central Information System would be the mechanism used for collecting information from the cooperating institutions and projects. Also the staff of this division would be responsible for the dissemination of information.

The following phase of Center development would involve the organization of a Skills Development Division. The responsibility of this division would be to identify present and future labor force needs and the educational training requirements, based on occupational categories, to meet those needs. The potential of low-income areas for fulfilling present and future labor force requirements could be determined through the joint responsibilities of the Central Referral System and Skills Development Division.

As these three divisions of the Center develop, the Center could move into a general stimulation and coordination role institution and finally into a consultative and project stimulation role.

The Center would not be a replacement or substitute for any existing educational or manpower organization or any central planning body within or between these two fields, but rather a place for these institutions to turn for information and direction in reaching their specific goals more effectively through the potential personnel resources of low-income areas. The Center would feed into these organizations a continuously flowing stream of relevant information.

Information gained by the Center could be effectively disseminated through direct channels to the state and local school and employment systems (at the policy-making and operational levels) and through indirect sources such as the Office of Education, Office of Economic Opportunity, Labor

Department, and private central planning bodies at the national, state, and local levels of operation.

Conclusion.

In conclusion, the limited findings of this paper are not new, but a reconfirmation of the old. Observers in 1900 suggested the methods and strategies used for effectively administering to the needs of the poor would not necessarily be the same as those used for the middle class. This same advice was eloquently stated and scientifically proven in the 1930's and 1940's. It was restated again and demonstrated again and again in the 1950's. Here we are in the latter part of the 1960's, and the state and local boards of education still haven't heard the message.

State and local boards of education possess the power to help individuals of low-income areas as no other existing organizations can. They require, by decree, the tailoring of education in low-income areas to meet the needs of the poor. Information is now available to achieve such a goal. This paper contains a tiny piece of that information.

The Systems Approach to Educational Systems Planning - Implications for the Design of an Educational Policy (Research) Support Center

by

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Working Paper

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THE SYSTEMS APPROACH TO EDUCATIONAL SYSTEMS PLANNING

Implications for the Design of an Educational Policy (Research) Support Center

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FOREWORD

This paper considers the concept of a "systems approach" to educational systems planning as a basis for providing guidelines for the design of an Educational Policy Support Center. The discussion is presented in three steps:

1. the systems approach as a process
2. its application to education
3. implications for policy research center

The first section provides an overview of the role of a systems approach in educational systems planning, followed by a discussion on "what is a systems approach." The latter discussion is intended to present the systems concept "independent of its application to any specific problem"; the examples, however, are skewed to socio-economic problems. The systems approach is presented as a "procedure" by which certain types of problems may be "processed"; the elements in this process are discussed in detail, together with the tools and problems of implementation.

This discussion of the "process" is followed in section two by a consideration of its application to education; some of the difficulties in applying these disciplines to educational systems planning are discussed. Section two also considers the state-of-the-art in "mathematical models in educational planning" as developed under the auspices of the Organization for Economic Cooperation and Development and utilized by Norway, Sweden, England and the Mediterranean Regional Project. Some preliminary efforts by Stanford Research Institute at structuring cost-benefit techniques for vocational training in the U.S. are briefly considered.

The next section documents an initial effort at "system definition" - defining the variables and their interrelationships in sufficient depth to provide guidelines for the design of a policy research center. This section discusses the problems and criteria for: defining "systems" boundaries, establishing parameters of concern, establishing the variability and interrelationships of the system "parameters" and determining the dynamics of change in the educational system. The final section considers the scope of involvement, the organizational and operational concept for a policy research center based on the concepts outlined in the previous sections.

In reading this paper it is important to keep in mind that we are discussing the "design" of *educational systems* (as opposed to the design of "instructional systems" or "learning systems"). We are concerned with: how do we "allocate" resources (teachers, facilities, curriculum, et. al.) to best meet future requirements. We are concerned with the *changes* that must be made in order *to reach goals*. Since the future is by nature uncertain, our objective is to develop a "model" which will permit an analysis of "alternate futures". Our goal is to develop an approach which is flexible enough to tolerate various alternate futures, yet rigorous enough to permit the results of the analysis to be compared on some cost-effective basis. To be meaningful for educational system planning, the results of the analysis should be expressed in terms of "required changes to educational system parameters". This, then, is the challenge to which this paper addresses itself.

There is one more point that should be made as a preface to a paper on a systems approach to educational planning: the systems approach is actually an engineering concept - it is applied to education metaphorically - i.e., the conventional "language of education" does not contain the necessary vocabulary and therefore, the engineering vocabulary is used to discuss the subject. There are two potential problems in this: first, the obvious "failure to communicate"; this we have sought to overcome through the use of many examples, and second, the possible semantic misinterpretation that this is a "nuts and bolts" approach to education; we can only advise the reader that this is not the case - that humanistic goals of education can be safeguarded within the context of a "systems approach to policy planning".

I.

INTRODUCTION

The purpose of this paper is to consider the application of a systems approach to educational system planning and to develop a framework for a systematic approach to analyzing "alternate socio-economic futures" in terms of their impact on educational system parameters. The "alternate futures" would be based on (1) socio-economic goals and (2) "what if..."conjectures of the future; the problem is to analyze these alternate futures in terms of educational system resource requirements.

The paper rests heavily on the assumptions that the future will be a relatively orderly outgrowth of the present, that there will be no major disjunctive changes in the social order and that we are therefore seeking to "direct"(or augment) an already operative system into something that best meets the needs of the future.

The Policy Research Support Center (the product of the NPA Pilot Study) is viewed primarily as an information system to support educational policy decision-makers; it is assumed that the decision-makers are seeking to take a "systems approach" to their responsibilities. The document is intended to define what is meant by a systems approach and to provide a conceptual framework -- to make explicit the elements, significant parameters, criteria and constraints -- with which the education policy maker must contend. In part IV an attempt is made to structure this framework in terms of the "boundaries of the system under consideration" and the "educational system variables". This framework,in turn, provides guidelines for the design on a policy research center, discussed in part V.

In accordance with the original proposal to the Office of Education, our "model" has been developed around a "manpower requirements" approach to an "inner city" educational system. While we feel that the concept and techniques outlined here would "transfer", the significance of various variables and their intra-relationships would change in different environmental settings. This paper, then, limits its area of concern to the vocationally oriented aspect of education; this should not in any way be construed to indicate a lack of realization that the "culturally oriented" aspect of education may be of greater importance.

The process outlined in Part IV for analyzing socio-economic goals in terms of their impact on the vocationally oriented aspect of education may be summarized as follows:

- translate proposed socio-economic goals into "manpower requirements for the future"; structure requirements in terms of Occupational Clusters and "skill levels" within these clusters.
- determine "what must be taught" in the schools in order to provide students with the opportunity to learn what they will need to know.
- estimate/analyze the impact of this "changing curriculum" on educational system parameters -- include research and innovations in instructional concepts and methods.

The Policy Research Support Center, then, is viewed as supporting policy decision-makers (i.e., it is not itself in a policy decision making role) by collecting and processing the information necessary to estimate the total impact (in terms of educational system elements) of possible socio-economic futures. The strategy would be to select policies which allowed the greatest flexibility in meeting the needs of the most probable futures.

II.

THE SYSTEMS APPROACH AS A PROCESS

PREREQUISITE CONCEPTS

Before beginning a detailed discussion of the elements, tools and techniques of a systems approach, it would be well to develop a broader framework of reference and to establish certain "prerequisite concepts". The following paragraphs consider:

- What is a system
- Educational systems planning as a resource allocation problem
- Educational systems and the concept of program management
- The contribution of the systems process
- The role of systems analysis in program management

First of all, then, "what is a system?" A system is an aggregation or assemblage of elements which are interrelated and interdependent in accomplishing some goal. For example: The educational system may be viewed as having students, teachers, curriculum facilities (from libraries to laboratories), learning materials, etc., -- all of which are interrelated and interdependent in accomplishing "student learning". The essential notions in the definition are:

1. multiple elements
2. interrelated
3. some common goal

The more elements and more interrelationships, the more complex the system; the educational system qualifies as an extremely complex system.

Systems may be classified as "open loop" and "closed loop"; the above definition is broad enough to include both categories.

A "closed loop" system uses "feedback" to control its own operation, this means that the output of the system is measured, compared with a reference and "fed back" to adjust the operation of the system. A good example is a home heating system. The room temperature (a function of the output of the heating system) is monitored by a thermometer ("output measuring device"); the thermometer"reading" is compared with a reference (the thermostat setting) and the furnace is accordingly turned on or off. Hence, the output of the system is measured, compared to a reference and fed back for system control; as the room temperature changes as a result of "leakage" of warm air, the system will detect the "problem" and turn itself on...when the "problem" is solved, the system will turn itself off.

An "open loop" system is a system which does not use feedback. An example of an open loop system would be a spring scale; a weight is placed on the scale, the spring stretches, the stretch of the spring is calibrated in standard units (say, pounds) and the output is read by the observer. The output (scale reading) is a function of the input (weight); the output is not used to "influence" the operation of the system.

Since automation is based on the application of the "closed loop" or feedback system concept; hence the word "system" has gradually come to refer to a "closed loop" system. (When we refer to a "systems approach" therefore, we are talking about a "process" which utilizes the feedback principle in its operation; it is called a systems approach by analogy to the closed loop - feedback hardware systems.)

Another important concept in the definition of a system is that "every system is the sub-system in a larger system". For example: the highway system is a sub-system in the transportation system. The "level" at which a system is defined will determine which elements are in (endogenous variables) the system under study (and therefore can be manipulated to better accomplish the goals of the system), and which elements are outside (exogenous variables) the system under study. For example, the educational system is a sub-system of a larger socio-economic system. The decision, say, to apportion a larger percentage of national resources to support farm parities, and a smaller percentage to education -- is a decision which comes to the educational system as a dollar constraint (on budget), it is not a factor that can be manipulated by the educational planners. Another example: the manpower "needs" of the human community "come to" the educational system planner from the broader socio-economic system. This is necessary to insure "relevant to life" curriculum. Indeed, many educators as individuals and as a "learned community", will contribute to the definition of these requirements; but this is in their role as community leaders and philosophers -- not as educational systems planners. The requirements for skills and competences (doctors, lawyers, bricklayers) must come to the educational systems planner in a format which permits him to translate them into requirements on "parameters" in his system which he can "manipulate;" for example: more science teachers, changes in curriculum, different facilities, etc.

The level at which a system is structured also affects the complexity of the system, (i.e., the number of elements and interrelationships).

For example: if the system were to be defined and structured at the individual student level -- it would be extremely complex; if, on the other hand, it is defined and structured at the national planning level, the parameters of concern would include such things as: "number of engineering graduates", "number of high school students", etc. It is important to structure the system at a level which is both meaningful and manageable, and "expand" to greater detail only as required and justified in terms of cost considerations. This concept of "level of system definition" is extremely important; failure to rationalize the limits and interfaces of the system under study -- to distinguish between those elements which can and those which cannot be "influenced" -- is a major source of problems in implementation and often results in a failure to distinguish between goals one wishes to achieve and constraints which must be taken into account as a condition for achieving them.

We have considered, then, a definition of the word "system" which includes both open loop and closed loop (feedback) systems, and the fact that there are various levels at which a system may be defined. (Criteria for establishing the level of systems under consideration are discussed later under "Problems in Implementation.") The following paragraphs consider the notion of: educational systems planning as a resource allocation problem.

In developing the concept of systems planning as a resource allocation problem, it is important to distinguish between the "design of educational systems" and the "design of instructional (or learning) systems;" the latter is concerned with variables at the classroom level (students' motivations, teachers' roles, effective utilization of media, etc.), the former is concerned with variables at, say, a national level such as (1) number of teachers required (2) types of training required (medical, legal, technical, etc.) (3) the school evaluation system (4) financial resources available to education (5) etc. The Paris International Conference on"mathematical models for educational systems planning" structures these two systems levels as "macro" and "micro" models. We are discussing here only the macro level which concerns itself with establishing the variables -- the things which can be changed -- in the educational system as a whole. It is obvious that the interface between these two levels of planning is of major significance.

The educational system planner (as defined here), then, is concerned with those "elements" in the educational system which can be changed, modified, controlled or influenced to better achieve the objectives. The educational systems planner must analyze the impact of his plans on these various elements -- and must decide how to most effectively apportion his money, and what changes need to be evolved to meet the requirements placed on him by the socio-economic system, within the constraints placed on him by the socio-economic system. This can be viewed as a "resource manipulation" type of problem -- where the term "resource" is used very broadly to include teachers and administrative procedures, and the term "manipulation" is constrained to respect the dignity and rights of individuals.

The notion of resource allocation brings us to the next concept to be considered -- program management. As discussed in a later section (The Tools of the Systems Approach), program management is not an essential element in the systems approach -- it is rather, a management concept, developed by industry, defense and aerospace projects, which utilizes a systems approach in the achievement of very complex multidisciplinary goals. Program management utilizes a systems approach in determining the impact on "cost, schedule and performance" of alternate strategies which might be used to accomplish its objectives, and then seeks to allocate resources in accordance with the results of this"system analysis".

It is sometimes argued that these concepts are appropriate for space and defense programs, but not for educational programs. We believe this argument is based on (1) lack of understanding of the systems approach as a process (the subject of the next section) and (2) the failure to distinguish between this macro and micro of system definition. At the macro level, the problem is one of resource allocation -- and, we feel, program management and system concepts do transfer.

As a"process", the systems approach may be applied to the solution of problems -- the "problems" may involve "open looped" systems, "closed loop" systems or "non systems". It is called a "systems approach" because,

(1) as a process, it utilizes the "feedback" or "closed loop" concept; i.e., the results (outputs) of "decisions" are measured, compared with a standard (original objectives) and used to "adjust" the process itself, and

(2) it seeks to interrelate all aspects and elements of the problem.

We have considered, then, the definition of the word systems, the utilization of the word in the expression "systems approach", the management, and "educational system design" as a resource allocation problem. The final notion to be developed before proceeding to a discussion of the elements of a systems approach is the role of systems analysis in management.

Systems analysis is a tool of management; at any point in time the output (recommendation) of the system analyst has a certain "degree of confidence". This confidence one has in the weighting factors and relationships within the "data processing" system. The difference between the recommendation of the system analyst and the actual decision made by the manager is called "management judgment". The results of decisions are "fed back" into the system analyst's model; the analyst's recommendations become more accurate and the degree of confidence increases. The model will therefore, provide a framework in which to accumulate the experience of the manager -- increasing in accuracy and confidence level by an operational process of trial and error.

A very simple example of this point would be found in the following: It is decided to purchase new, faster, copying equipment for a large office operation -- and to decentralize the function, placing copying equipment more conveniently for individual users. The analyst can collect data as to the present loading of the system and translate these requirements into requirements for the faster equipment; he can "locate" the new equipment in accordance with loading -- convenience criteria; but he can only guess as to the additional loading which will occur due to the equipment being more convenient to the user. The management decision must be made partially on the basis of this guess or estimate of additional loading. After the equipment is operational, the actual increase in loading is measured, the adequacy of the initial decision (purchase) is evaluated and equipment is re-located, or perhaps additional equipment is ordered. The "experience" is "recorded" quantitatively by the analyst and the next time a problem of this type arises, he will have "something to go on"-- i.e., a ratio or "percent of increase" which will increase the accuracy of the decision-making process (and so, the level of management confidence) in the future.

The points we wish to make with regard to the role of "analysis" in the decision process are:

(1) the analyst's model is kept in the "world of reality" by the"feedback" of the results of operational decisions and

(2) the use of systems analysis as a mangement support tool does not preclude management judgment.

The purpose of this section has been to develop a "semantic set" for the sections which follow and to develop certain concepts which we hope will give perspective as to the potential role of a systems approach in educational system planning. The system approach does not solve any problems -- it is not a mysterious box from which good solutions emit. It is, however, a process which, if properly applied, forces the user to clarify his objectives, to evaluate alternate solutions and to make explicit the criteria and rationale on which the selected solution is based. The purpose is to get the most value (however this is defined) per dollar -- and to be certain that all aspects (development-operational-continuing maintenance, etc.) of the problem are taken into consideration before the decisions and/or selections are made.

THE ELEMENTS OF A SYSTEMS APPROACH

The "systems approach" is an approach, that is, a procedure by which certain types of problems may be "processed." The procedure is characterized by certain essential elements. These are:

1) a clear definition of goals and/or objectives
2) a clear definition of constraints
3) the establishment of measures of effectiveness
4) the synthesis of alternate solutions (which include consideration of all significant elements/aspects of the problem)
5) the establishment of cost elements

6. cost-effectiveness analysis to establish trade-offs between the alternate solutions
7. continuing evaluation and feedback.

The "systems approach" is clearly iterative; once an analysis has been made, and the cost of achieving certain objectives within certain constraints is determined, it may prove necessary to "go back" and change an objective or constraint. For example, suppose an objective of "train 500 technicians to the 'A' level of performance in 6 months", and a budget constraint of X_1 dollars is given. If an analysis of alternate ways of achieving this objective -- taking into consideration all facility costs, learning materials and training aids, teachers, recruiting of students, et al., -- all indicate that it will cost at least X_2 dollars, it becomes necessary to change either the objective (e.g. the number of technicians to be trained, or the level of performance required, or the training period) or to change the budget constraint and provide X_2 dollars. (Incidentally, the analysis should provide some guidance as to which parameter would be best to change. For example, the analyst might report that: "the objective could be met for 400 technicians by using existing facilities and equipment; going to 500 will necessitate additional rental of facilities -- if the six-month time frame is to be met". The systems approach, then, is a process of successive approximations to the solution of a problem; it is a continuous process of change to reflect the acquisition of new and better data, and to reflect the changes in requirements, goals and constraints which result from previous iterations and the "feedback" of results from previous decisions. With this in mind, we may proceed with a discussion of each of the "essential elements outlined above.

A Clear Definition of Objectives:

To be useful as the basis for decisions, goals and objectives must be stated in measurable terms; i.e., there must be a way of knowing when they have been achieved -- or the degree to which they are being accomplished. They may themselves be assigned priorities and specified as "necessary" or "desirable".

Initially, goals (aims, objectives, systems requirements) must be specified without much knowledge of their implications in terms of "cost" "schedule", etc. This might be called the "zeroeth order of approximation". The synthesis of "ways and means" to accomplish these goals and the analysis of cost and effectiveness might well cause the goals to be modified. This brings into focus three important factors in "goal setting":

1) the establishment of realistic goals is accomplished by a process of successive approximation wherein necessary goals are held constant and "desirable" goals are manipulated to fit within the constraints placed on this system by the next higher system of which it is a part.

2) since all systems are sub-systems of larger systems, goals must be structured within the scope of "responsibility" of the system under study. Goals must be achievable through the manipulation of variables within the system under consideration; goals which exceed these boundaries must be structured at a higher system level and the "sub-system interfaces" clearly specified.

3) implementation planning goals should be specified in terms of measurable system elements and/or variables.

The clear statement of objectives is the basis for establishing the measures of effectiveness. The question ultimately becomes: Which of these alternate solutions best accomplishes the objective? In order to answer this question, it is necessary to know what the criteria for measurement are. If there is no basis for measuring the effectiveness of a given solution, there is no basis for analysis (cost-effectiveness trade-offs) and there is simply no "systems approach". This problem is discussed below under "Measures of Effectiveness".

A Clear Definition of Constraints:

Constraints on the successful accomplishment of an objective come from many sources, such as:

.the existing system
.laws of nature
.financial constraints
.political constraints
.organizational constraints
.legal constraints
.public and personal attitudes
.etc.

Constraints on the existing system would include such things as existing facility investments, the "time constants" (the time it takes to make a change) of specific variables (e.g., re-training of teachers), organizational establishments and responsibilities, power structures, etc.

Constraints are not simply "negations" to be circumvented if possible; they are "necessities" to keep the process from concentrating on attaining a high degree of efficiency without regard, for example, for personal values, The clear statement of objectives is the basis for establishing the measures of effectiveness. The question ultimately becomes: Which of these alternate solutions best accomplishes the objective? In order to answer this question, it is necessary to know what the criteria for measurement are. If there is no basis for measuring the effectiveness of a given solution, there is no basis for analysis (cost-effectiveness trade-offs) and there is simply no "systems approach". This problem is discussed below under "Measures of Effectiveness".

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Constraints are not simply "negations" to be circumvented if possible; they are "necessities" to keep the process from concentrating on attaining a high degree of efficiency without regard, for example, for personal values, rights and freedoms. Some constraints can be changed, some cannot; some can be, but should not be; some should be, but will not be. Significant constraints should be made explicit and factored into the synthesis of alternate solutions to the problem.

Measures of Effectiveness:

The measures of effectiveness are the criteria to be used to establish the degree to which a given solution contributes to the accomplishment of a goal or objective. Measures of effectiveness should therefore be specified in terms that are indicative of the performance of the system, are measurable, and related to the specified goals.

The question here is: "what are valid indications of system performance?" -- and, "what are valid techniques for their measurement?" Again, in the "zeroeth order of approximation", we may not know which parameters constitute valid criteria for goal measurement. In other words, we have to translate the "goals" into the measurement of elements within the system; later experience may indicate that the initially selected parameters are insensitive, contaminated, invalid and/or not susceptible to analysis in the light of the cost of data collection and processing requirements.

An example of a measure of effectiveness might be the following: Suppose we have a goal of: "basic literacy for everyone". The criteria for determining the degree to which this goal was being met by the educational system might be: a) the achievement of a 6th grade reading level as measured by standardized tests and b) the percentage of 8th grade students who achieve this level.

We have made several significant decisions which now permit us to evaluate the effectiveness of the educational system in meeting our goal. First, we have decided that "basic literacy" means "6th grade reading level". (We could have taken a broader interpretation of the word literacy and required more than just reading ability to be measured, or, we could have set a higher or lower grade equivalent). Second, we have decided that "everyone" means "all 8th grade students". (Again, we could have selected a much broader frame of reference).

What we select as the measures of effectiveness for a given objective will be influenced by the validity, reliability, cost of data collection and processing, and the required degree of accuracy.

Synthesis:

The synthesis process is essentially creative. It consists of developing logically consistent "solutions" to the problem of meeting objectives within the specified constraints. One important constraint might be: use the existing system as the point of departure. In this case, the problem centers on the possible ways to modify or evolve the present, say, educational system into a system which will more effectively meet present and/or future goals. When this constraint is invoked, a much greater emphasis must be placed on understanding not only the physical and organizational characteristics but also the "dynamics of change" in the existing system. The problem, then, becomes one of synthesizing practical solutions built on effective utilization or modification of existing resources and on a realistic appraisal of the political, social and financial environment; the solution must be structured in terms of the manipulable variables including the potentially available resources. Again, we are brought to focus on the importance of recognizing the scope of the system (or sub-system) of interest and the constraints on the dependent variables which must be recognized in order to "synthesize" workable solutions.

A major aspect of the system synthesis function is to insure that all aspects of the "proposed solution" are made explicit. This is necessary so that the actual total cost of the solution can be estimated. The synthesis must include such things as:

- what new materials must be designed, developed and validated; what are the tasks, costs, and schedules required to do this?
- what re-training is necessary; how much, how long, what will we do in the meantime; can we provide "in-service" teacher training?
- what will the system cost to install and make operational?
- what will the system cost to operate and maintain after installation?
- what additional personnel requirements will be generated by the system; what are the salaries and skill levels of these people?

.what new facilities and lab equipment might be required?

.what are the organizational implications of this solution?

.etc.

Cost Accounting:

Obviously a major factor in every planning decision is: cost. What one might expect to be one of the "hard"(quantitative) parameters in the system, in practice often turns out to be extremely difficult to establish. This is partially due to the fact that cost data is seldom "broken out" into the categories required for this (particular) study, partially due to the many possible assumptions which must be made in structuring a cost accounting system (for example: how should laboratory equipment used only by a few students in specialized fields -- be "charged off"), and partially due simply to "obsolete" accounting methods and cost control.

In the context of educational systems planning, the cost of accomplishing specific functions must be determined both for the existing system and for the "proposed systems" or modifications. The cost accounting must be structured (or at least, translatable) into terms of the system elements, functions and measures of effectiveness which are used to describe the operational system. Here again, the initial iteration of cost analysis may fall far short; the important thing will be to evolve a system of budget accounting and planning for the operational level of management which is meaningful to the "definitions" of the planning levels of management.

Analysis:

The heart of the systems approach is the analysis. This "element" provides for (1) problem structuring and system definition and (2) cost effectiveness trade-offs. The problem of structuring a system definition consists of:

- isolating and defining the system of interest in terms of "internal" and "external" variables.
- structuring the description of the system in such a way that it can be analyzed and conclusions drawn about the aspects of interest.
- establishing the system variables and the sensitivity of the system performance to variations in these parameters.
- establishing the data accuracy requirements for the required level of system planning.
- formulating the relationships between the variables and establishing the parameters (and their"variability") which enter into these relationships.
- defining and structuring techniques to measure effectiveness
- specifying structure for cost accounting which is compatible with system definition (and vice versa).

The objective of the "analysis" function is to determine which solution to the problem will most effectively accomplish the objectives for the least number of dollars -- all things considered. It will provide guidance for the allocation of resources within the system based on "trade-off" studies. The term "trade-off" refers to the process of compromise and/or "priority setting" necessary in the design of a system. The trade-off may be between cost and performance (this equipment is faster and more accurate -- but costs much more than some other equipment); the trade-off may be between system characteristics (the faster the process, the less accurate); or the trade-off may be between methods of implementation (given a certain number of classes to be taught and a certain "teacher salary budget"-- we can pay fewer teachers more, to teach more classes each -- or more teachers less, to teach fewer classes each.

Continuing Evaluation and Feedback:

The importance of continuing to refine the systems definition or model and to up-date based on the experience of an evolving operating system is apparent. As the process is repeated, the successive approximations provide more accurate and more reliable planning and trade-off data. The purpose of the "model" is to provide a framework for the accumulation of this experience; the actual results of decisions and parameter changes are "fed back" into the "model" to verify its operation; the model is therefore continuously adjusted to the "real world." The feedback, then, must be in terms of the system elements used to describe the system so that the accuracy of predicted to actual events and costs may be studied. These data requirements must be carefully defined and the limitations of the collection and processing well understood; due to the tremendous volume of information which is processed, it is generally desirable to implement rigorous procedures and, where feasible, automate.

The purpose of the feedback, then, is to incorporate a "built in" learning mechanism that will allow us to refine our analytical tools.

THE TOOLS OF THE SYSTEMS APPROACH

In the previous section we considered the systems approach as a process and discussed its "essential elements." In applying this process over the years to various areas of government and industry, certain organizational and operational "tools" have evolved. While not essential elements in the process, program planning, program evaluation and review techniques, (PERT) operational and mathematical models, and statistics -- have come to play a major role in implementation. The paragraphs which follow briefly discuss these "tools".

Program Planning:

A program plan is necessary to insure that all of the elements of the system are taken into consideration in the analysis. The program plan provides a break-down of all tasks which must be performed to accomplish a given objective, the schedule on which each task must be performed, and the interrelationships and inter-dependencies of tasks. This "task analysis" aspect, then provides the basis for determining the numbers and types of manpower, the equipment, and the procedures required to accomplish the objective. This, in turn, is the basis for estimating the cost of development, implementation and operation of a "program." A program plan for a specific problem would contain specific milestones, schedules, deliverable end items (may include such things as reports and technical papers), assignments of responsibility, etc.

Many formal program planning techniques have been developed by the Aerospace and Defense industries -- as well as by private corporations;

most of these systems (PERT, STAR, etc.) have been computerized in high level languages and will operate on many computer systems. For additional discussion, see: "Program Evaluation and Review Technique -- Applications in Education" published by the U.S. Department of Health, Education and Welfare, Office of Education.

Models:

A model is an analog or simulation of the real phenomena; there are model railroads, model homes, and physically scaled models of redevelopment areas; there are "paper models" illustrating information flow, operational procedures, methods and processes. We are concerned here with the "paper models" as analytical tools.

The purpose of a model is to provide a vehicle for the orderly structuring and communication of a "problem"; the model will define a system or process in terms of the system elements and their inter and intra relationships, such that these elements and relationships may be varied to study the effect on overall "system performance." The models may be "operational" or "Mathematical" (or both) depending on how the elements and relationships are defined. Mathematical models are quantitative, generally more flexible, easier to manipulate, difficult to structure and dangerous to use. The problem in utilization arises from the fact that the mathematical expressions are abstract, and the assumptions, simplifications and precise term definitions are prone to "get lost" in the user's enthusiasm.

Nevertheless, the model is a useful (if not indispensible) tool of the systems analyst. It tends to make explicit:

(1) the scope of the system under consideration.

(2) the external and internal relationships.

(3) the assumption made in defining the system.

(4) the need for specific information.

It may be used to:

(1) analyze the effect of changing the system elements.

(2) determine the sensitivity of selected variables to overall system performance (and hence to determine the relative accuracy of information required for specific elements.)

It is important that the model be structured in terms of the "elements of interest" at a level of detail appropriate to its utilization; this, of course, relates back to the level of responsibility of the user and the decisions he intends to support through its use.

An important aspect of mathematical models is the possibility, where adequate information is lacking on certain variables, of generating "families of curves" or "envelopes of acceptable values" for these unknown variables, based on known or assumed combinations of values for other parameters. For example: We may not be able to estimate the number of students who will pursue a certain course; however, we may know, with reasonable accuracy, the number of teachers that will be available, the facilities and the laboratory equipment which will be available, the "social need" for people with this skill, etc. From the known variables and their time constants, we might conclude for instance that: we will be able, in 3 years to "process" between 5,000 and 8,000 students in this course of study... if the number of students turns our to be less than 5,000, there will be very inefficient (less than, say, 70%) use of the resources (other variables); if the number of students turns out to be greater than 8,000, there will be inadequate facilities to meet their requirements. In addition we might conclude (parameter sensitivity analysis) that: the limiting variable on the high end (8,000) is the number of trained instructors and it takes two years (time constant to train instructors in this field; the second limiting element is lab equipment which must be specified at least eighteen months in advance (to permit the necessary facility modifications).

The example (purely hypothetical) illustrates the concept of defining the envelope of change within which the "undefined" variable can change without exceeding the limits defined for efficient system performance; the number of students could vary from 5 to 8 thousand without violating the criteria (overcrowding and "70% utilization"). We could conclude that this aspect of the system is not very sensitive to the number of students. The example also illustrates the use of the model in determining the sensitivity of other variables such that -- if it is estimated that the number of students will probably exceed 8,000-- we have a basis for decisions and action.

Statistics:

While the value of statistical techniques to systems modeling should be apparent, two important conditions must be kept in mind. First, the statistics must be carefully structured to the level of responsibility and types of decisions to be made by the user. Few things cause operational level management to loose confidence in analytical techniques more rapidly than statistics structured several echelons above their particular decision-making level. For example, "the average time taken to learn this material" may be meaningful to the planner in the state board of education; it has a hollow ring to the classroom teacher who has just inherited 20 dullards.

The second "condition" which must be taken into account in the use of statistics is the rate at which statistical samples"lose" relevance and accuracy.

Within the limitations of these "conditions", statistics are, of course, essential to planning; the magnitude and cost of collecting the data to be processed makes extrapolation from samples absolutely necessary.

PROBLEMS IN IMPLEMENTATION

We have considered, then, some of the basic concepts "prerequisite" to a discussion of the systems approach, the role of a systems approach, the essential elements in the process and some of the "tools" which have been developed. This section considers some of the problems generally encountered in seeking to implement a systems approach; later sections discuss its application to education.

In this section we will briefly consider the problems of:

- lack of data
- establishing system "boundaries"
- establishing measures of effectiveness
- data accuracy
- the multi-disciplinary aspect

Lack of Data:

Many of the problems in implementing a systems approach are apparent from the above discussion of the process; the first problem already recognized by most readers, is the "lack of the required data". True, there is usually a "lack of data", it is seldom in the proper format, it is almost never structured properly; however, not having the facts is not solved by using a different technique for "processing" them. The decisions might be easier on the conscience of the decision-maker; the lack of supporting information might be less obvious but, the decisions will be no more valid -- and are not likely to become so. The utilization of a systems approach will provide a criterion for the collection of relevant information which -- in time -- will evolve a "science of decision-making" in the areas of concern.

System Boundaries:

One of the most difficult problems in implementing a system approach is, stated over simply, defining the system -- that is, where does it "begin" and where does it "end". What variables are "in"the system and can be manipulated -- which are "outside" the system and constrain its operation but cannot be "manipulated" by the "manager" of the system under consideration? If these boundaries are not defined adequately, a great deal of time and energy is spent in analyzing the wrong problem (usually someone else's) and not solving the one assigned.

There are three criteria to be considered in attempting to rationalize the scope of a system under consideration:

1. the functional integrity of the system
2. the elements of control within the system.
3. the level of implementation.

The "functional integrity of the system" means that the system definition should contain all of the significant functions which are necessary to accomplish its goals or objectives. These functions have different degrees of significance, different degrees of variability, different degrees of controllability, and different "time constants" for change.

Developing such a conceptual framework allows the system to be scrutinized for "elements of control," i.e., what are the "tools" that the "manager " uses to manipulate the variables. There are at least three degrees of control: 1) direct control, 2) indirect control (influence), and 3) no control (constraint). Again, making these factors and control elements explicit provides a basis for trade-offs, and rational decisions. Section 3 of this paper attempts to develop this framework of variables, control elements, "time constants" etc. for an educational system.

The third criterion in establishing the scope of the system is the level of implementation; in our context, this is often determined by the organizational level of the planner. If the planner is to provide broad guidelines at a national level -- the system elements will be structured at that level; if the planner intends to provide direction at a lower, operational level of management (say, state, or school board) the system elements must be defined in terms that are meaningful at this level. For example, at the state level, the concern would be for the allocation of resources, the number of students, etc. within various areas in the state; national planning might be more concerned with regional problems such as the Appalachian and Ozark regions.

The first criterion, then,(the functional integrity of the system) is associated with the "horizontal" scope of the system, the third criterion (the level of implementation) is associated with the "vertical" scope; the second criterion(the controllable elements in the system) is concerned with both the "horizontal" and the "vertical" structuring of the system. The "systems definition" will have a very significant effect on the magnitude, type and formats of information required to support the decision-maker.

Measures of Effectiveness:

Another problem area in implementing a systems approach is in defining measures of effectiveness. Once the types and levels of decision-making are understood, the question then centers on the parameters to be used to measure how well a given solution meets a given proposed objective. This is especially difficult in the educational system where "values" are involved and where no one agrees -- and few are willing to state -- the value of the values. Actually, the problem of establishing the measures of effectiveness is often due more to "a failure to establish tangible, measurable behaviorable objectives" in the first place, than it is to "an inability to determine the value of values".

An important factor in establishing the measures by which the "performance" of the system will be evaluated is that of selecting "parameters" which are measurable in a time frame which is consistent with system evaluation and meaningful responses. Measures should be selected which provide valid feedback in the shortest possible time frame. For example: an objective might be to reduce the juvenile crime rate by instilling socially acceptable behaviors and extinguishing socially unacceptable behaviors. The measure of effectiveness might be police records of juvenile crimes in a given district. While this is a valid (assuming "valid" police records) and behaviorally measurable criterion (assuming that the "get caught" -- "not get caught" ratio remains relatively constant), the time frame between the "action" and the "measuring of its effect" may be in the order of several years. It would, therefore, be well to establish some additional "shorter range" measures of effectiveness.

The establishment of measures of effectiveness, then, is one of the major challengers; it will certainly tax the creativity of the testing and measuring people to expand their concepts of measurements and to analyze the relationships between various levels of "systems". The only way to establish the validity of a test (i.e., does it actually measure what it purports to measure) is empirically. An external, measurable criterion must be selected and the correlation between this "standard" (or standards) and the testing instruments (not limited to written tests in the traditional sense) must be established. Factor analysis and "cluster analysis" (used by industry to select pilot areas for marketing samples) would seem to provide the tools with which to address this problem. Once the validity and reliability of the instruments havebeen established, their value to the system would far exceed the cost of development.

Data Accuracy:

Related to the level and type of decision-making are the accuracy requirements for the information on various system elements. Collection and maintenance of data is expensive; to collect data in greater accuracy or more frequently than necessary is wasteful -- to fail to have sufficient resolution and/or accuracy in some significant parameter can negate the value of the entire information system and the decisions which are based on its use.

The accuracy requirement for specific data is a function of the sensitivity of the parameter it specifies in the system. This is essentially a "weighting" problem which is very difficult to establish since it involves a cost-effective analysis of the cost of data collection for various degrees of accuracy. It also requires a very broad systems perspective since often a very simple parameter in a seemingly unrelated area is a better criterion than the "obvious" ones. For example: the story of the major industry which spent much time and energy in trying to establish a criterion for adjusting the production rate of large appliances and finally "discovered" that lagging the "new construction indices" by six months,so that the production rate was related to changes in the volume of new construction,was the answer.

If the information system, required to support a systems approach, is properly thought out, the accuracy of information will be increased as the data from decisions which are implemented are fed back into the "data base," i.e., as the results of the actions taken are evaluated and compared with the "predictions" of the systems analyst.

Multi-Disciplinary:

The final problem area to be considered in this section is the operational/management problem in organizing and controlling the multi-disciplinary team necessary to take a systems approach. A systems approach generally requires the inputs, perspective and close cooperation of senior people in various fields. No single person is capable of the breadth and depth of knowledge necessary to structure, say, the educational system, -- with its inter and intra relationships -- and to "trade-off" alternate implementations against cost-effective criteria. The problems of intercommunication within a project are complicated by the problems of interdisciplinary communications. Good "systems engineering" is usually the product of a seasoned team wherein the individual members have achieved a high degree of respect and a signficant insight into the capabilities of the other disciplines and other members of the team; it is also imperative that the "customer", i.e., the user, understand and appreciate the process which is taking place.

We have considered, then, some of the problems in the implementation of a systems approach. These include the collection of required data, establishing accuracy and "frequency of updating" requirements for information, the establishment of system boundaries -- inter and intra relationships of variables, establishing measures of effectiveness, and the organizational-management problems in the synergistic operation of a multi-disciplinary group.

We repeat the "warning" in the Foreword: "...nobody said it was going to be easy" -- and proceed to the next section on the application of these concepts to education.

III.

APPLICATION TO EDUCATION

The above section considered the concept of the systems approach as a process and, by examples, some of the problems in seeking to apply this concept to socio-economic systems in general and to the educational system in particular. In this section, we will discuss briefly the "overall" problem of applying systems techniques to education and some of the "state-of-the-art" efforts which presently are in progress.

The PROBLEM

In the paragraphs which follow we consider first, the problems in the system under study and secondly, a problem "created" by systems techniques.

Within education, typically, no one has "systems responsibility", or sufficient financial control to enforce the compromises of systems decisions. The financial control of the "system" is generally in the hands of some 2,500 Boards of Education -- most of which are basically motivated to keep taxes from increasing; few, if any, have the perspective to look beyond their own immediate community and its problems, or to take more than a "short-range" view of their community.

The responsibility for curriculum -- i.e., "what is taught" -- lies theoretically with a "curriculum specialist". However, this specialist usually has little or no control at the classroom level -- the actual content of the text book, and the individual teacher's understanding thereof, seems to be the ultimate determinant of "what gets taught." The content of the the text book is generally established by an "expert author" from within the educational community, in conjunction with an "editor" provided by a text book publisher; tradition and "the previous edition" play a strong role in content determination; seldom is adequate consideration given to field testing and the validation of the material; "relevance to life" plays a small role (if any) and the "non standard" student referant categories are generally ignored in the interest of the "mass market."

The conscientious curriculum specialist relies on professional journals and publications to keep him informed of developments on a broader scale; the objectives of education are structured at such a high philosophical level as to give little or no guidance to the person trying to translate them into meaningful, relevant-to-life learning experiences.

The educational "system" is possibly the only operation of its size that maintains "quality control" in the hands of the persons "developing the product." Evaluation of the "products" by any "outsider" is strongly resisted; only within the last few years has the competition for higher education served to place a measure of performance on elementary and secondary education. The "informed" public is beginning to "demand" quality for their children; unfortunately, there are few "informed" parents in the inner city, and the quality of education between the middle and lower class schools is diverging. The "competition for higher education" places a measure only on the "academic track;" the measures of the "vocational track" in terms of subsequent employment, earning levels and drop-out rates would indicate that there are serious problems in this area (Ref., Kaufman Report - 1966).

In addition to these problems of the "system under study," there is also a problem -- a potential danger -- "created" by the system techniques. The danger of cost-effectiveness analysis applied to education can be very simply stated: the concept is basically oriented to converge on efficiency -- and efficiency is not the sole, nor even the most significant, criterion in education. Care must be taken in defining the system variables and the measures of effectiveness to "build in" the constraints that protect individual rights and freedom of choice. Most of the educational planning models discussed in the next section would "optimize" on "what is good for society" without regard for individual aspirations, freedom of choice, or "fulfillment." For example, based on cost-effective criteria alone, education can be viewed as an economic investment in the individual. The best investment is the one that gives the best return. From this it might be concluded that all available funds should be channeled for engineering lab equipment -- and none for typewriters to train secretaries, since the potential tax return of professional engineers exceeds the potential tax return for secretaries. This example is much oversimplified, but the need for considerations in addition to socio-economic efficiency is extremely important.

EDUCATIONAL SYSTEMS STUDIES -- STATE OF THE ART

The literature documenting what has been done in the area of educational systems studies is widely scattered in conference proceedings, journals and unpublished papers. The material reviewed for the discussion which follows is considered representative -- but certainly does not preclude the possibility that a significant contribution went "unreviewed." The major source articles of "state of the art" information for this paper are:

(1) Proceedings of the "Organization for Economic Cooperation and Development" Conference on Mathematical Models in Educational Planning; published in 1967.

(2) Set of unpublished papers from Stanford Research Institute Conference on Vocational-Technical Education -- April 1967. (to be published as conference proceedings in the near future).

(3) The Mediterranean Regional Project : Forecasting Educational Needs and Social Development and,

(4) Promise for the Future: A Systems Approach to Education -- (a Time-Life Research Study).

(5) "A Systems Approach to Higher Education" -- a National Science Foundation Study by Michigan State University.

(6) "University Cost Structure and Behavior" -- a National Science Foundation Study by Tulane University.

The formal application of systems techniques to the field of education is very limited. There are probably several reasons for this: For one, the development of systems management concepts within government agencies in general is of relatively recent vintage. Changes of the magnitude implied by taking a systems approach will have to be reflected organizationally -- if not in structure, then in personnel. Most educators and educational administrators lack the experience as well as the incentive to apply "sophisticated" management techniques to solving their own problems.

Another factor which constrains the use of systems techniques is the lack of a "feedback" mechanism . The test and measurement function is essential to a system techniques. The development of valid and reliable achievement testing tools are, again, relatively new; they are expensive and difficult to develop. While achievement tests are evolving slowly in the academic areas, there seems to be even less activity in the "evaluation and measurement of cost-effective administration" area. A systems approach cannot be effective until the measurement, and feedback to the proper decision-making elements, is established.

There have been some theoretical efforts by individuals to structure a framework of variables for cost-benefit studies; while these provide some interesting concepts, they have not progressed through any type of parameter-sensitivity analysis.

Some interesting aspects of the problem which begin to emerge are: the necessity for including both social and individual benefits separately since there are times when these are opposing factors; the necessity and approach to including student characteristics; and the already well-known fact that many of the parameters will not submit to quantizing and therefore will have to be stated as "assumptions", "constraints", "advantages" and/or "disadvantages" to a proposed concept.

Some of the more sophisticated work done to date is documented in the Technical Reports of the Paris Conference on Mathematical Models in Educational Planning.(1) This group has developed models for the flow of students in the educational system, the teacher/classroom requirements, and the "costing and financing of educational plans." They have worked on optimum enrollment policies, on optimizing curriculum and on the allocation of resources between the economy as a whole and the educational system. An excellent paper on control concepts in educational planning models is also included.(2)

The techniques have been applied in Sweden, Norway and England at various levels and with varying degrees of success. (Again, the initial iterations can really only be expected to structure the criteria for the collection of information).

Of particular interest to our efforts are three models: 1) general optimization modelfor the economy and education,(3) 2) the flow of students in the education system and the teacher/classroom relationship (4) and

(3) the optimum educational curriculum.(5)

The "general optimization model for the economy and education" seeks to establish the optimum allocation of physical resources *between* education (considered as an activity which produces the knowledge needed for the training of skilled workers in all sections of the economy) and the "commercial" economic activities. (Note that the allocation of resources is *between* the educational system and the other systems of the socio-economic system -- not *within* the educational system.)

The student flow model seeks to relate the flows of students at different times and places; to forecast the evolution of the flows of students; to forecast the evolution of the population outside the educational system classified by level of educational attainment; and to determine the flows of students necessary to achieve specified targets of "educational output". The teacher-classroom model seeks to relate these two elements to students and curriculum and estimate the number of teachers and classrooms required to attain the targets of an educational plan.

The curriculum optimization model seeks to optimize the sequence (based on"prerequisites" established by educators) for a curriculm. The "system" of prerequisites found, for example, in university catalogues is presumably based on a hierarchy of skills. Since the lives of teachers are too short to teach everything, a choice of what is to be included in a curriculum must be made. This model seeks to assist the educationalist compare the various courses with their costs in resources.

Another relevant study, again sponsored by the O.E.C.D., is documented in the report of the Mediterranean Regional Project.(6) While this study was oriented toward the establishment of manpower requirements and does not really address the problems of alternate educational system strategies to meet these requirements, it nevertheless provides "one approach" to the elements of forecasting manpower requirements. The following quote summarizes these elements:

"Thus, the elements involved in forecasting manpower requirements and supplies as a basis for ascertaining the required expansion in the various levels and branches of the educational system can be outlined as follows:"

"(a) Prepare an 'inventory' of manpower for the base year (e.g., 1960) classified by branch of industry and occupation, using an occupational classification system that differentiates as far as possible among occupations requiring different levels of education and, at the highest levels, between 'scientific' and 'general' education."

"(b) Forecast the size of the total labor force for the 'target' year (e.g., 1975) and for the intervening period at five year intervals."

"(c) Estimate total employment in each sector and branch for the forecast years."

"(d) Within each sector and branch, allocate total employment for the forecast years among the various categories of the occupational classification system. Aggregating the requirements for each occupational category in all sectors and branches gives the total "stock" of manpower required for the forecast years classified by occupational category."

"(e) Convert the data on requirements by occupational category into data on requirements by educational qualification. This is necessary because the several broad occupational categories cannot be expected to be homogeneous with respect to required educational qualifications."

"(f) Estimate the anticipated supply of personnel with each major type of educational qualification for the forecast years on the basis of:

1. present stocks;
2. anticipated outflows from the existing educational system; and
3. losses due to death, retirement and withdrawal from the labour force."

"(g) Compute the change in annual outflow from the various levels and branches of the educational system necessary to create balance in the forecast years between (e) and (f)."

"(h) Calculate enrollments in each level and branch of the educational system necessary to achieve the required annual outflows."

In conclusion, the state-of-the-art in the application of systems techniques to educational systems planning is in its beginning, conceptual stage in the U.S. There are many obstacles to its application once developed. The techniques and methods developed by other countries and documented in the Paris Conference proceedings are more or less applicable to U.S. "educational systems" in general and can provide a basis for developing a more systematic approach to educational systems planning in the future.

IV.

SYSTEMS DEFINITION - A FRAMEWORK

We have considered, then, the problems of applying systems techniques to educational planning in general; the purpose of this section is to outline the nature and scope of the "system" under consideration - in sufficient depth to provide guidelines for the design of an Educational Policy Research Center.

In this section we shall consider the "boundaries" of the system defined by the NPA proposal; our focus is on the manpower and social "requirements" and their implications to the educational system in low-income urban areas. Hopefully, the methodology which we develop will have application beyond this particular problem. In addition to defining system boundaries, we will discuss the elements in the educational system which can be changed (i.e., what are the endogenous and exogenous variables in the system), "what is it about each of these elements that can be changed", and "how are these elements interrelated"? This is oriented toward defining the system under consideration in terms of the elements which may be manipulated to achieve future goals. Basically, our approach is to relate the manpower and social requirements to the educational system through the curriculum -- i.e., what is to be taught (or made available to learn) in the "classroom", and then to relate "what is to be taught" to "how is it to be taught" -- i.e., to required educational resources (teachers, classrooms, etc.). As we project our system into the future to analyze the implications of change in terms of educational system parameters, we will also have to reflect the possible changes in educational resources due to the impact of technology; hence, educational R & D is an important consideration in the overall process.

SYSTEM BOUNDARIES

In attempting to define and structure the "area of concern" of the NPA pilot study, we shall discuss four concepts and then relate them to our efforts. These concepts are:

(1) the arenas of learning:
    home
    school
    work

(2) an education/manpower utilization model

(3) the elements of the "planning process"

(4) an individual, student-oriented curriculum

Arenas of Learning:

Figure 4.1 illustrates graphically the concept of "arenas of learning". The purpose of this illustration is to focus on several aspects of the problem which we are addressing, namely:

. There are at least three major arenas of learning -- the home, the school and work -- these are interrelated in a way which is totally unique at an individual level, but may be generally categorized at a higher level. For example, electronics is generally not taught in the home arena.

. Most of the early learning is in the home arena, then emphasis shifts to the school arena, then gradually to the work arena; most of the "late" learning is work experience. The illustration shows gross age brackets for this process.

. The manpower requirement or vocationally oriented "area of interest" is generally scoped to:

a) the "school" blocks

b) those "school" blocks that feed "work" blocks

c) "school" blocks in the 12 to 17 year age setting.

. These "school" blocks in the 12 to 17 year age setting receive inputs (students) that have already had a great deal of "pre-conditioning."

. That the affective domain or value sets, which tend to have significant social implications (as well as "work" implications), are structured primarily in the earlier age settings where the home arena is predominant.

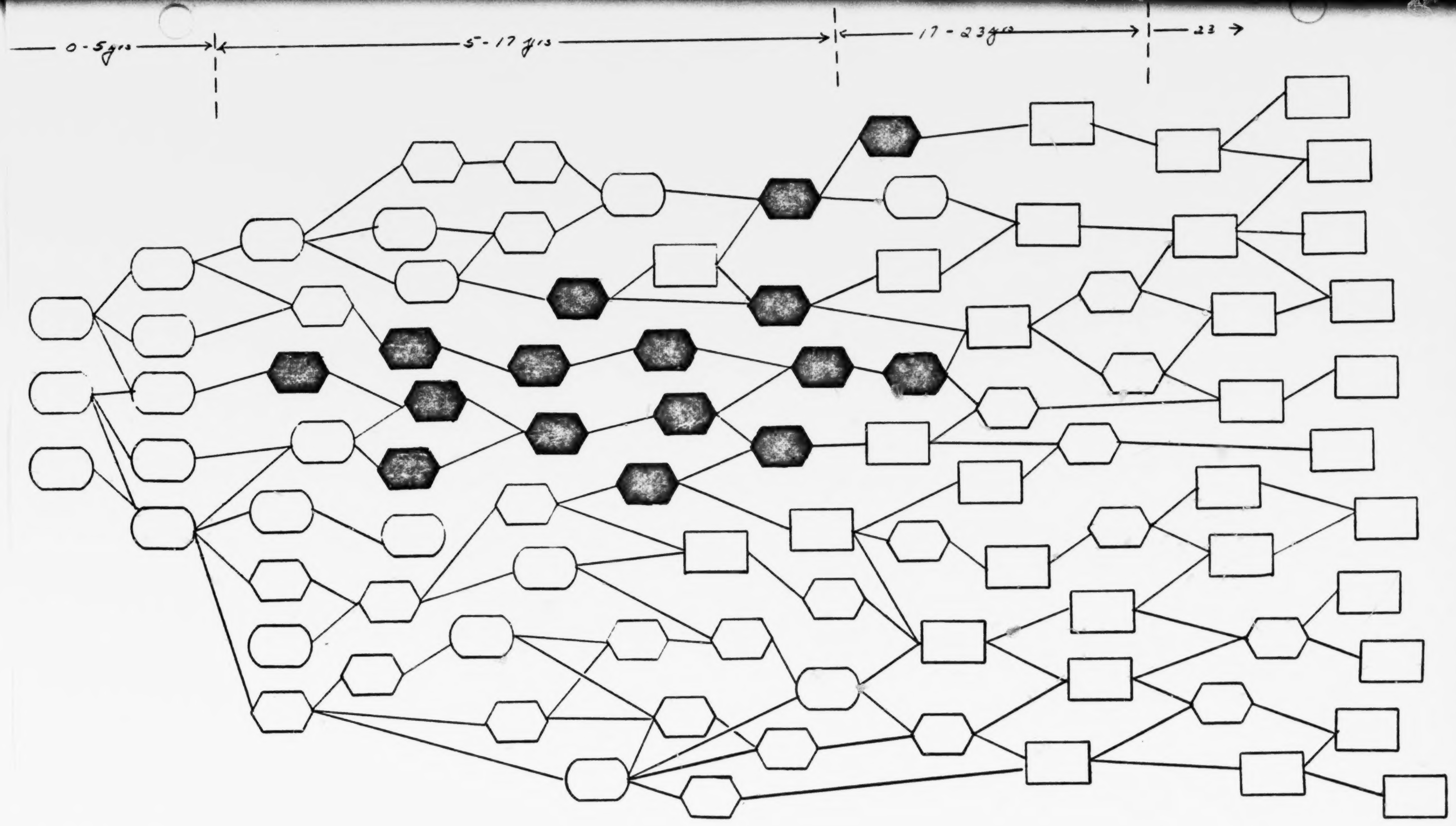

0-5 yrs
5-17 yrs
17-23 yrs
23
Home
School
Work
NPA Study

Figure 4.1 - Arenas of Learning

. That the entire process takes place in a complex environment which significantly affects what can be accomplished in any one segment (arena) -- neither the economic (work behaviors and attitudes) nor the social aspects of the "education" problem can be solved in the schools' arena alone.

The very important point to be kept in mind here is that we are defining the boundaries of the system, not the boundaries of the problem. The problem -- social and economic -- cannot be solved within the scope of the system under consideration (i.e., the "school" blocks -- regardless of what takes place inside them -- will not solve all of the social and economic problems of the inner city. The task of the educational system planner is to ascertain how the school blocks can best contribute to the solution of the problem -- accepting as constraints the pre-conditioning that the inputs (students) have had, the demands which the world of work will place on our products ("graduates") and the social environment in which we must operate. We may lament the inner city conditions; as citizens, we may seek to solve the "total problem", but as educational system planners, we are confined to the manipulation of educational system resources (teachers, curriculum facilities, etc.), so as to contribute to the solution of the problem in a most cost-effective manner.

Education/Manpower Model:

The second concept to be developed is concerned with the utilization of the product of the "school" blocks -- viz., students. Our purpose is to describe the flow of students through the school system and into their first full-time employment. The model can be developed in greater detail to analyze the student flow and transition coefficients between the various individualized curriculum structures discussed below (under "Individual, Student-oriented Curriculum") and to plan for facility loading; its purpose here, however, is to focus on the elements of student flow through the "school" blocks and into the "work"blocks.

Figure 4.2 illustrates this concept using the Washington, D. C., area as an example. For purposes of discussion, we will consider S^1 to be the first year of high school (it could be considered as "3 years of junior high school" or "4 years of high school", etc.) The model illustrates the following:

(1) Students in the first year of high school (S^1) come from

  a) grade school in D.C. ($S^{o}dc$).

  b) grade school outside D.C. ($S^{o}ndc$) (people who move into the area).

  c) students from outside D.C. who failed S^1. (fS^1ndc).

  d) students from within D.C. who failed S^1. (fS^1).

(2) The "output" of the first year of high school goes several places:

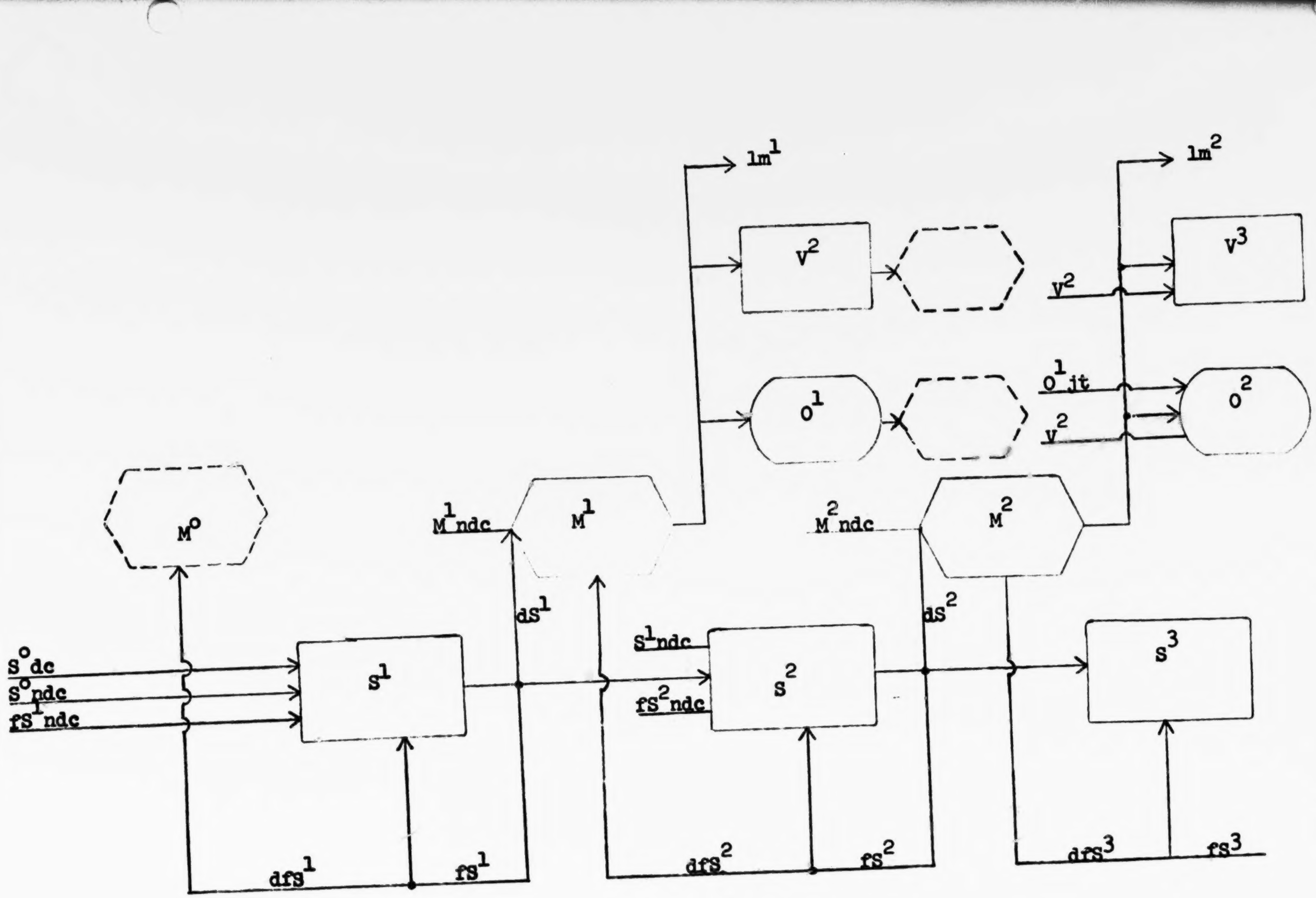
  a) some fail (fS^1) and return to S^1 the next year.

  b) some fail and dropout (dfS^1) -- these go into an "available manpower with '0' education level". (M^o)

  c) some pass and go on to S^2 the following year.

  d) some pass and "dropout" (dS^1) -- these go into and available manpower with '1' education level". (M^1)

(3) The square boxes on the diagram illustrate "people increasing their skills in formal learning environments" (schools, job corps, vocational/trade school); the hexagons represent "manpower in inventory" (the objective will be to minimize the people in this category); the round ended boxes represent people gainfully employed in an occupation.


lm¹
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S° ndc
fS¹ ndc
S¹
S¹ ndc
fS² ndc
S²
S³
dfs¹
fs¹
dfS²
fS²
dfS³
fs³

Figure 4.2 Education/Manpower Model

(4) The input to the M^1 hexagon (manpower with '1' educational level who are "available for work") is comprised of

a) people who have passed S^1 but decided not to continue to S^2. (dS^1).

b) people who have moved into D.C., who have passed S^1 but decided not to continue to S^2. (M^1ndc).

c) people who have failed S^2 and decided not to repeat.(dfS^2).

(5) The "output" of the M^1 hexagon goes to

a) a vocational training school for which '1' educational level is a prerequisite. (V^2).

b) an occupation for which '1' educational level is a prerequisite. (O^1).

c) leave D.C. (move, death, et al.). ($1M^1$)

One aspect of the problem brought into focus by this concept is this: If M^1 (the manpower in "inventory" with a "1" level of education) is to be minimized, it will be done by making sure that the '1' skills are salable; i.e., that the buyer (employer), finds the product (student) useful -- or, at least, can make it useful through minor modifications. The parameter in the educational system which most closely relates to "skills development" is the curriculum; the problem is to establish the link between what is taught in the schools and what is needed in the world of human relations and in the world of work. One concept which is useful in making this transition is that of "occupational clusters." In this concept, the world of work is catagorized into occupational clusters -- such as medical, legal, clerical, etc. and then into the skill levels within each cluster. The "school" curriculum of say S^1 then, must be optimized not only with respect to "prerequisite behaviors" (hierarchy of learning) but also with respect to the maximum numbers of occupational clusters and the maximum level of entry within each occupational cluster. This is to say that a student leaving S^1 -- for whatever reason -- would leave with a maximum number of occupational options at a maximum possible level in each (one of the options, of course, would be S^2).

Our objective then is to reduce our "available manpower" (M^1, M^2, ...M^n) inventory, as defined above by smoothing the transition at all levels, into the world of work in various occupations. Here again, many of the factors on which success will depend, will lie outside the "school" system -- our system must be designed to contend with these exogenous variables.

This brings us to the next concept to be discussed: the individual student-oriented curriculum.

Individual, Student-oriented Curriculum :

The challenge proposed to the "curriculum" in the previous section needs further expansion; the purpose of this section is to discuss some of the characteristics which a curriculum structure must have in order to provide the flexibility, (both with respect to the individual student and with respect to the subject matter content) requirements implied by the occupational cluster approach.

Figure 4.3 illustrates the points we wish to make. The underlined capital letters denote specific occupational clusters; for example, L represents the legal occupational cluster, M the medical, C the clerical, etc. A hexagon with $\underline{LM}^1$, then contains the manpower inventory which is suitably prepared to enter the legal cluster at the '1' level of education. One of the goals of curriculum design then is to make the '1' level of education correspond to the highest cluster competency level in the maximum number of clusters. Figure 4.3 illustrates an individual student's program showing a student taking "learning modules" from various curriculum areas which prepare him to (1) enter either the legal or medical clusters at '1' level of education (could be occupational cluster level of 2 or 3...), (2) enter a technical vocational school at level '2' ($\underline{TV}^2$), or (3) continue in school (S^2).

The curriculum is varied in depth and number of "learning modules" on an individual student basis so as to (a) maximize his number of possible "choices for the future" at any point in his school career, (b) insure that the "society critical" subjects are learned, (c) provide opportunities for personal growth in a broader process of acculturation.

One fact that is brought into focus by the above discussion of Figure 4.3 is that the '1' level of education (corresponding to 1 year in school) does not correspond to any specific level in the occupational clusters. It is an administrative convenience which might well be eliminated from an educational point of view; that is, the criteria for "certification" of a student might be the entry level of occupational clusters and/or entry to higher modules.

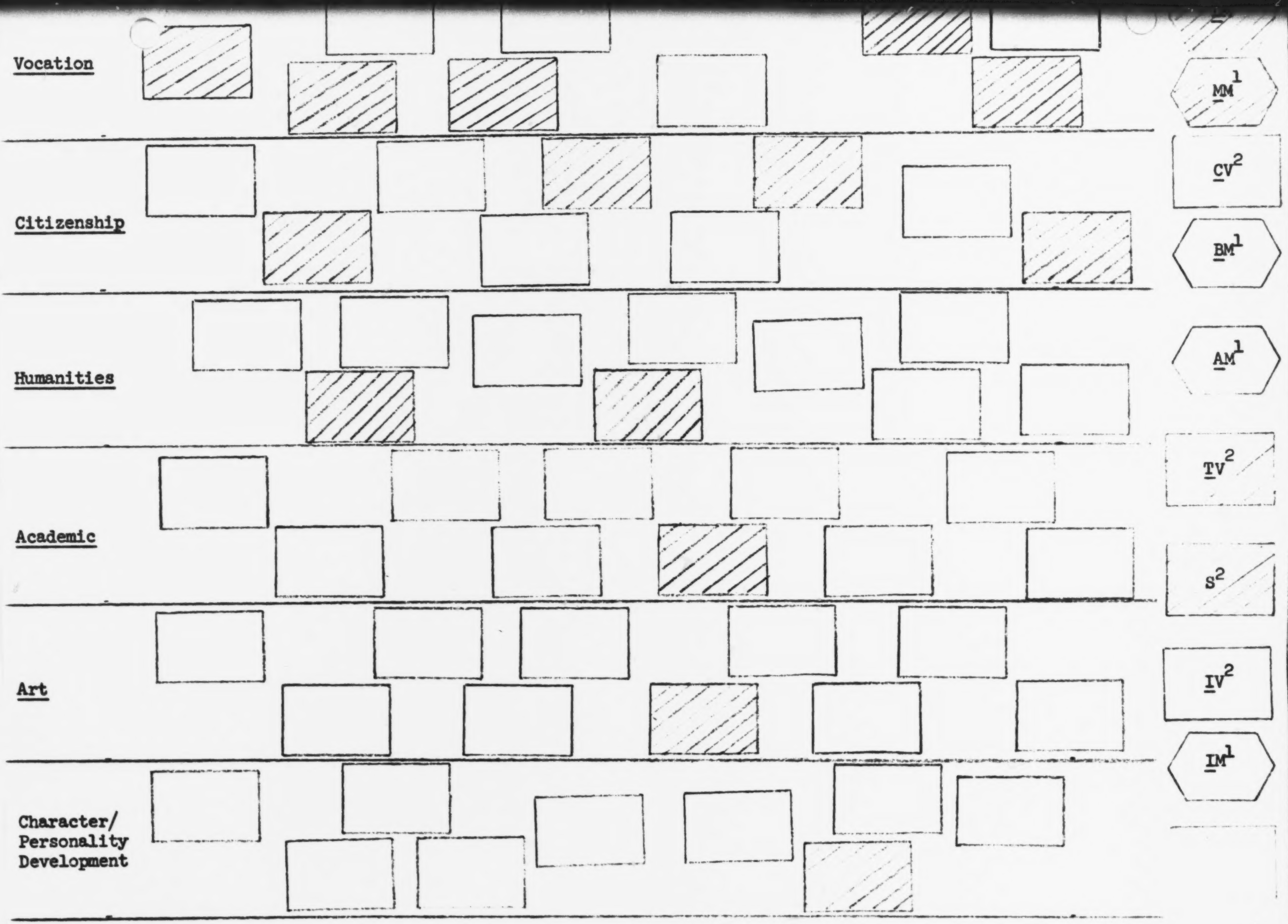

Vocation
Citizenship
Humanities
Academic
Art
Character/
Personality
Development
$\underline{M}M^1$
$\underline{C}V^2$
$\underline{B}M^1$
$\underline{A}M^1$
$\underline{T}V^2$
S^2
$\underline{I}V^2$
$\underline{I}M^1$

Figure 4.3 Curriculum Structure Concept

This would be more motivating to students and more meaningful from an educational point of view (included as prerequisites to certification would be modules in citizenship, humanities, etc.). With modern data processing equipment, the previously prohibitive administrative problems raised by this concept can now be overcome.

The concept outlined above obviously presents a real challenge to the "curriculum designers", to counselors who assist the individual student to "build his competence," optimizing all of the parameters discussed above, to the "planners" who will try to anticipate the occupational cluster requirements far enough in advance to adjust the educational system to meet the needs of the individual and provide him with meaningful choices and to the people responsible for the analysis of "implications in terms of educational resources." Presumably, the content of some of these modules could be "canned audio visuals" augmented by teachers and "laboratory work," and data processing would be available to the administrator and to the guidance counselor in structuring individual programs in terms of students' interests, capabilities, needs, hierarchy of prerequisites, maximum occupational clusters and entry levels and "required" modules.

In attempting to structure the "boundaries of our (NPA-Pilot Study) system" then, we have discussed three contributing concepts, namely (1) the arenas of learning and "what part of which arena" are we looking at, (2) the education/manpower utilization model which illustrates the relationship between manpower inventories, occupational clusters/levels and curriculum and (3) some curriculum implications of the cluster/level concept.

Before attempting to integrate the above factors into a defined planning system, we will briefly consider one more "prerequisite concept" namely: the "process" of an Educational Planning Support Center.

Educational Policy Support Center -- The Process

Figure 4.4 illustrates the process which an educational policy support center might utilize in analyzing the impact of social and economic trends/goals in terms of educational system parameters and recommending education policy which is realistic both in terms of probable futures and in terms of required educational resources.

The policy support center would begin its analysis with social and economic projections based on national goals and trends; the projections would reflect probable alternate futures on a continuum through the next 15 to 20 years. (It is necessary to project future trends on a continuum because, what might be good long-term policy may spell short-term disaster; sound policy recommendations must reflect a realistic evolution).

As illustrated in Figure 4.4, the social and economic projections provide a basis for projecting (1) occupational clusters (e.g., what people will be doing in the "world of work"), (2) the manpower requirements in terms of occupational clusters and competency levels, and (3) the social environment in which individuals and groups will "find themselves." In addition, the social and economic projections will provide a basis for synthesizing alternate educational policies.

The projected social environment and occupational cluster requirements, together with alternate educational policies will provide a basis for "what is to be taught" in the school. For example, if a national health goal is established, the social and economic projections will show a high demand in the medical occupational cluster. One possible educational policy would be that the public school system should provide "free" education to all individuals desiring to enter this cluster. (Other policies might be for low-interest loans for students, or to subsidize existing institutions to provide "on-the-job training" for the lower competency levels.). This policy, along with the emphasis on the medical cluster, would affect "what is to be taught" at secondary and higher levels of education; when the future quantities of trainees required are reflected into the analysis, an estimate of the education resources needed to implement this policy can be made. Note that the benefits of educational research (e.g., better instructional techniques and tools) are reflected into the determination of the impact on educational variables. The results of this analysis are "fed back" to cause the policy (or goal) to be modified if necessary -- i.e., when the full impact on educational resources is realized, it may be necessary to modify the original goal to make it "realistic." Those policies which are deemed realistic in terms of their impact on resources become "recommendations" -- along with their estimated impact on specific variables in the educational system.

In addition to outlining the process of analysis used to reflect the impact of social and economic changes in terms of educational system parameters, Figure 4.4 shows an "information loop" which examines the educational policy with respect to educational research and innovation, the impact of research and innovation on the operational educational resources (variables) and the feedback of the results of this appraisal to the educational policy. Hence, the "process" of the policy support center would include the evaluation and integration of educational research (and its impact on educational resources) in its policy recommendations.

The objective of the educational policy support center, then, is to develop, to whatever level of depth is necessary for valid decision-making, an "information system" to implement the process outlined in Figure 4.4.

In an effort to structure the boundaries of the system under consideration, we have developed four concepts. The first two, namely, the arenas of learning and the educational/manpower utilization model were aimed at establishing the external boundaries of the "school" system in its socio-economic environment. The third concept, namely, the curriculum structure, was directed to a better understanding of the primary "transition variable," i.e., the channel through which societies' "requirements" are translated into educational system parameters or resources. The fourth concept, e.g., the process of the policy support center, was concerned not with the boundary of the "school" system, but rather with the scope of the policy support center.

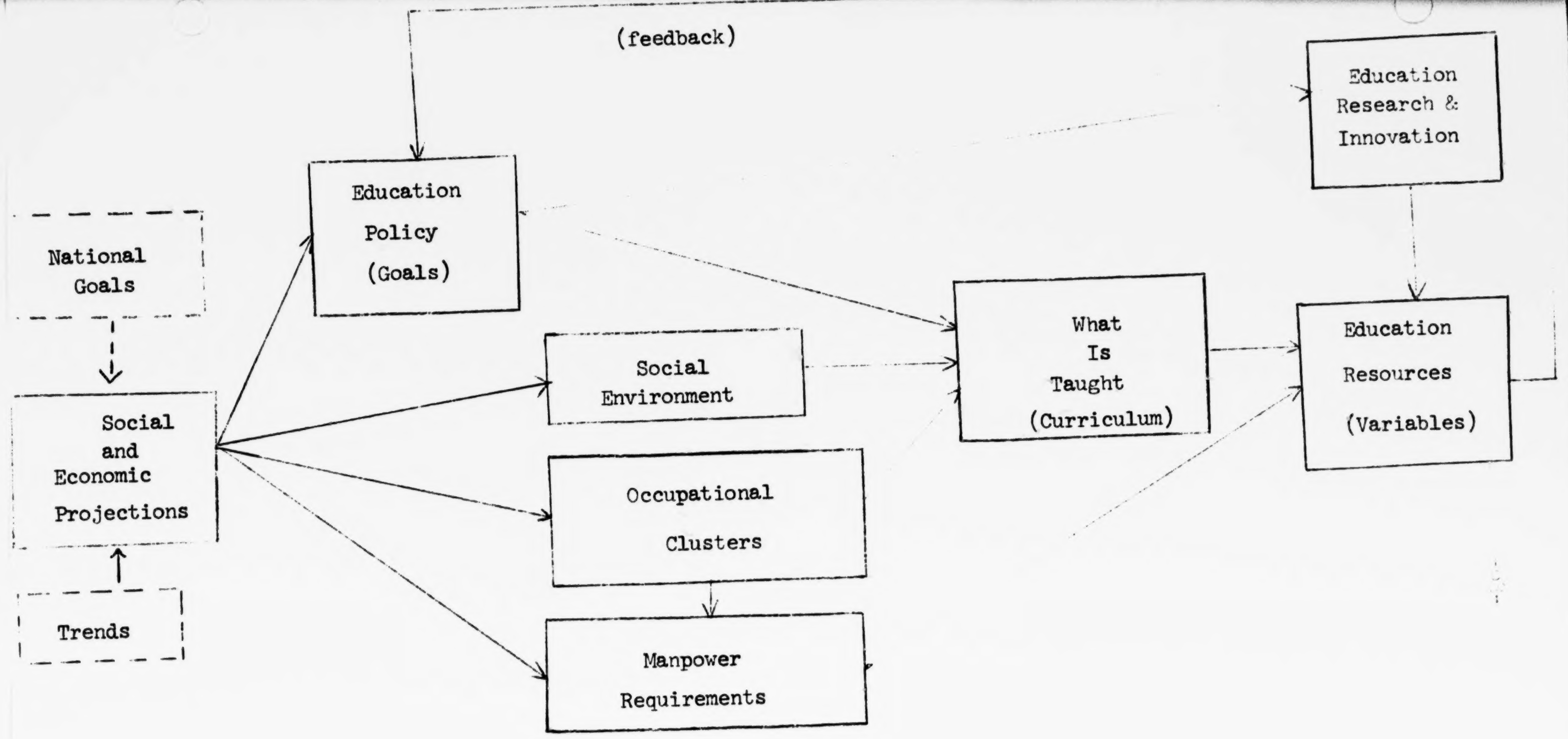

(feedback)
Education Research & Innovation
National Goals
Education Policy (Goals)
What Is Taught (Curriculum)
Education Resources (Variables)
Social Environment
Social and Economic Projections
Occupational Clusters
Trends
Manpower Requirements

Figure 4.4

Educational Policy Support Center -- Process

In conclusion, the boundaries of the "system under consideration," and the analysis which we propose to make, require that we focus our attention on the following:

1. the school arena of learning -- accepting as "given" the preconditioning of the student from his home and social environment.

2. the vocational (or "preparation for the world of work"), the "society critical" social behavior and the personal mental health aspects of education. The former generally implies grades 9 through 13; the latter, grades kindergarten through 13.

3. the variables within the school system which can be manipulated to accomplish educational objectives.

4. the educational research and its impact on learning and on educational system resources.

5. social and economic changes that have implication for education.

6. the dynamics of change and the impact of technology on both the endogenous and exogenous variables; this includes the changing roles in occupations.

Having considered the general boundaries of the system, we proceed to a consideration of the variables with which the educational planner must contend.

THE VARIABILITY OF VARIABLES

In order to change the performance of a system in a predictable way, it is necessary to have the best possible understanding of that system in terms of its variables -- that is, what are the "things" in the system which can be changed, to what degree are they "changeable," how are they controlled or "influenced," what is their "response time," (i.e., how long does it take to implement a desired change) and what is the "force field" in which they operate.

In this section we shall attempt to isolate those variables which are significant to educational system "design" and discuss their changeable characteristics. The analysis is more illustrative than exhaustive; its purpose is to structure a framework and make explicit the factors which may be manipulated in order to change the system performance. These are the factors which must be taken into consideration in designing and implementing a realistic Educational Policy Research Support Center.

In the paragraphs which follow, we have attempted to define the variables in terms of "today's system" in the belief that this is the point of departure for "tomorrow's system;" we consider the following:

Endogenous Variables

1. Teachers
2. Curriculum
3. Instructional strategy/Media
4. Students
5. Administration/Organization
6. "Libraries"
7. Facilities
8. Test and Measurement

Exogenous Variables

1. Budget
2. Occupational Clusters

The division into exogenous and endogenous variables is not nearly so clear-cut as the breakdown above would indicate. Many of the variables shown as endogenous actually have some aspects which are "externally controlled" (this may be part of the problem!); this will be discussed below as each element is considered.

Teachers :

In looking at the "teacher variable" in the educational system, we find at least two aspects of variability: the number of teachers to teach various subjects can change, and the required qualifications of teachers can be changed. Hence, the significant variables of the teacher parameter in the system are:

1. quantity -- by type (i.e., the number of teachers, catagorized by broad subject matter areas).
2. qualification -- by subject area, teaching methods and teaching role.

This is to say that in doing educational system planning, it will be necessary to consider:

1. the quantity of teachers required in certain subject areas.
2. the required qualification in terms of knowledge of subject matter.
3. the required qualification in terms of "ability to teach" or "ability" to manipulate the learning environment.
4. the requirements for qualification in different roles in the teaching process (for example, professional teachers, teachers' aides, teachers' assistants, etc.).

As the high school curriculum becomes more sophisticated in order to meet both the higher level vocational cluster requirements and the rising college entrance requirements, the requirements for teacher subject matter qualification will become more significant. On the other hand, if educational technology succeeds in developing validated replicable learning materials, the quantity of teachers with greater subject matter expertise should decrease, but the quantity of "teachers" who can manage the learning environment so as to create the conditions of learning -- should increase. This implies a shift in the teachers role -- and perhaps a future restructuring of the teacher occupational cluster to provide for these various roles.

The "instruments" for the control of the teacher variable in today's educational system include:

- Teacher Certification.
- Teacher Salary Structure.
- School Accreditation.

If we wish to make changes in the quantity and characteristics of "teachers," these will be among the primary "tools" used to bring about the required change.

Recognizing the response time of a variable is extremely important to good planning. Demands for sudden changes in the variable (i.e., changes which do not recognize the natural response time) will be strongly resisted. For example, teachers can be expected to band together to fight sudden changes that make them bear the brunt of "poor management responding to crises." Changes planned within the natural response times of the variables permit a "normal" adjustment and are much more likely to be accepted.

The "force field" in which the teacher variable operates includes such factors as the National Association of Educators, teachers unions, many elementary school teachers are married -- their teaching job being the "second" family job (this affects not only mobility but also the "frustration level" which they will tolerate), etc. Variables within the educational system which have the greatest affect on the teacher variable are:

1. the curriculum (i.e., what is to be taught).
2. the instructional strategy (i.e., what media is used; how is the instruction to be accomplished; what is the "teacher's" role).
3. the number of students to be taught (i.e., student-teacher ratio).

Curriculum :

In examining the "curriculum variable," we find several aspects which may be manipulated to accomplish system goals; these include:

- Content.
- Time Allocation.
- Structure of instructional messages.
- Sequence of instructional messages.

The content or subject matter to be taught may be changed; the time spent on various subjects may be re-distributed, new subjects being introduced which will add to the total time and/or take priority over existing subjects for students working towards certain objectives. The curriculum may be re-structured into, say, smaller learning units which provide greater flexibility in individualizing a course of study and meeting occupational cluster/level requirements. Various elements of the curriculum may be sequenced differently to accomplish different objectives in terms of longer range and shorter range occupational cluster goals of the student. (Reference: the "curriculum structure" discussion in the previous section).

The "tools" for the "control" of the curriculum are very nebulous. In some cases, state laws may dictate certain minimum hours to be spent in certain general subject areas; the only enforcement seems to be curtailment of funds (a highly improbable action). Actually, the question of "who 'owns' the curriculum"? doesn't seem to have an answer. John I. Goodlad's essay entitled "The Curriculum" (7). documents the results of this fact.

The time constant for a significant change in curriculum content is also very difficult to establish because there is always a question as to (1) when the change really began, (2) to what degree has the curriculum actually been changed and (3) when can a change be said to be "implemented". In the context of the system under consideration, a nominal minimum of 6 years from the time a committee is collected to structure a "new"concept into a "teachable format" to the time the material is generated, pilot-tested and available for distribution-- seems to be a reasonable estimate. This does not include time for teacher training, teacher acceptance and effective integration at the classroom level of the majority of schools; this may take another 10 years or, as a matter of fact, may never take place. Depending on your definition of the "start" date, the "New Math" took 12 - 17 years to reach the "65% of the schools level".

The parameters which significantly affect the curriculum variable are:

1. The occupational clusters/levels available to the potential students.
2. The entry behaviors of the students (i.e., the pre-conditioning background and motivations of the students we receive).
3. The home and work arenas of learning (i.e., the cultural environment in which this curriculum must "operate").

Instructional Strategy :

The instructional strategy parameter is concerned with "how do we teach" (as opposed to "what do we teach" -- curriculum). Basically, this is a question of how do we "present" learning material. The strategy may vary from individualized instruction with each student progressing at his own rate to large groups in "lock step;" from complete teacher lecture to packaged learning modules; from books to audio-visual dial access; from classrooms to "home learning centers." This parameter obviously has an extremely wide field of variation -- and the variations will have a very significant affect on all other endogenous variables. We may define the variables of the instructional strategy parameter as:

1. the degree of individualization of instruction (as opposed to the degree of individualization of curriculum which is included under "structure" of the curriculum parameter).
2. the degree of utilization of "packaged learning materials" and electronic communication techniques and media.
3. the degree of utilization of other arenas of learning (for example, on-the-job training, work experience integrated into the school schedule, etc.).

There are no "tools" (at least at the system level under consideration) to control this parameter. There may be some indirect controls through accreditation requiring certain minimum facilities, etc., but there is no control as to their use. The selection or rejection of new teaching techniques or strategies is almost entirely at the classroom level, yet, the teacher who would want to utilize such techniques has no control over the "tools" she would need to do it. For example, a teacher who decided that she would like to individualize instruction and utilize "package materials" would find so many constraints (lack of equipment, administrative policies, purchasing procedures, etc.) over which she has no influence -- that she would soon give up in disgust.

Not only, then, is there no control over the instructional strategy parameter at the system level under consideration, but the system level which does have control, cannot implement the changes if it wanted to -- because it has no control over the resources and policies which would permit change. If change occurs -- it will be because of an unusual combination of teachers and administrators.

The time constant for making a significant, permanent, massive change in the instructional strategy parameter as defined above is really not known since it has never been done. Presumably, with no contraints from other parameters (for example, the curriculum and learning materials are "ready when needed."), a change of this type could be made in 7 to 8 years. This estimate is based on: 1 year to design the change and plan an effective method of implementation, about 1 year to educate the people involved as to their "new role" and how the new strategy will operate. A gradual, pilot implementation through a period of 4 years, and 1 or 2 additional years for the "oscillations" to damp out and the system to stabilize into a smooth running operation. Once a model has been developed, the same changes implemented in another school system should take less time, say, 5 to 7 years.

Students:

The two aspects of the "student variable" which are of concern at our level of interest are:

1. the number of students.
2. input student behavior.

While both of these variables may change, and the changes will significantly affect other variables (curriculum, facilities, etc.) in the system, both are exogenous variables. The public school system has to take all students and do something with them; no "screening" systems to pass only "qualified persons" are permissible.

Fortunately, the number and "pre-conditioning" of students is fairly predictable. The pre-conditioning aspect (including the home arena, elementary school, neighborhood environment, etc.) is a larger problem in some localities than others (for example, Mexican-American-Indian schools in the Southwestern part of the U.S. constitute a very heterogeneous grouping from an educational point of view). The input student behaviors must be reflected into the curriculum, content, structure, and sequence of the given school location.

It is interesting to note the effect the "input student behaviors" parameter has had on the Modern Math Curriculum development programs. The initial design and implementation was for the higher elementary grades, the "entry level" therefore pre-supposed earlier learning of conventional Math. The program was later extended downward to include the lower grades; it then became necessary to re-design the higher grades to adapt to the new pre-conditioning in the earlier grades. Science -- a process approach -- presently under development, has taken a different approach -- namely, starting at the early elementary school levels (kindergarten) and building upward; they are faced with the problem of "staying ahead" of the students who have started using the curriculum or of developing a "transition" back into the conventional system for the higher grades.

Libraries:

The term libraries is used here to include all of the storage and retrieval of information -- both reference materials and learning materials, in whatever medium of communication they exist -- associated with the school system.

The content of these files is now supposed to be doubling every seven years; the format for the presentation of this expanding content is infinite. The library is, then, the victim of:

a) expanding content and
b) the introduction of new media.

Presently, the library (for the most part) stores "reference material" and not too much "learning material" -- although the reference material is often used as learning material.

The "things that are changeable" in the "library variable" include:

- the degree to which the "library" is integrated into the instructional system (or instructional process).
- the amount and types of information stored -- the structure of storage (for example, what material is stored at the school level, at the public library branch, in the main library ...).
- the media in which information is stored; the methods and storage and retrieval.
- the methods of inter and intra-library communication.
- the methods and media for distribution of materials (i.e., the student-library interface) including display terminals in classrooms, in study centers, in student carrels, and in private homes.

The operation and maintenance of library systems of the future will represent a significant element of cost; the changes made in operation implied by the "variable features" mentioned above would significantly change its entire operational concept, procedures and facilities -- and certainly its contribution to education.

The public library system is outside of the control of the educational system; under these circumstances, the school uses the public library system for reference materials when requirements excede their own internal facilities.

The only "control" of the school library function seems to be through the accreditation system which generally provides a "number of books per student" type of criteria. There are no management tools available to"encourage" a more integrated learning system or a change in library operation. In this regard, it is in much the same category as the "instructional strategy" variable.

Facilities:

Facilities in the context of the educational system under consideration would include such things as: land, laboratories and equipment, and office space and equipment, gymnasium and atheletic equipment, computers, teaching machines , etc., auditorium, classrooms and teaching equipment, buses, etc.

The variability of these elements include:

- the quantity.
- the quality.
- the distribution.
- the physical characteristics (functions and design).

The objective of system planning is to establish priorities and design for the best possible combinations of facilities to meet the educational requirements of the system at any point in time. Since there are always limited resources, there will always be a question of priority; the objective should be to establish this priority in terms of "effectiveness of contribution" to objectives.

In some cases, certain minimum facility requirements are established by the state board of education; however, these are definitely minimum and generally do little to insure that the architecture is designed in accordance with functional requirements.

Because major facilities represent a long-term investment (say, 30 years), and since they can become a major milestone to progress, careful consideration should be given to growth and/or modification potential -- and to basic flexibility in meeting future alternate functions as well as present multi-functions.

While the "response time" from the standpoint of "need for a school" to the time of "having one built" can be relatively short and can be anticipated and planned well in advance based on community growth trends, the long-range implications of the decisions constitute the major "response time" problem. The facilities we build today -- with all their "money-saving" shortcomings -- will be with us for 30 years. "Existing facilities" are always a major factor in planning since they represent a major existing financial investment.

Administration/Organization :

The "administrative procedures" and "organizational structure" variable are extremely important parameters in the educational system. The true function of both is to create an environment in which "teachers" and students can interact to achieve "learning" in the student. Over a period of years, administrative procedures and organizational structures can grow so rigid as to constitute a major constraint on the operation of the system. The failure of education to keep pace with social and technical developments, the time lapse between educational research and implementation is by definition, a management problem. The proper resources have not been brought together in an environment which motivates individuals to accomplish the necessary changes. Significant changes in instructional strategy will affect the administration possibly more than they will the faculty. For example, truly individualized instruction with, say, 2,000 students progressing at their own rates through an individualized curriculum which is itself responding to vocational requirements, using integrated multi-media instructional strategies, branching on individual student differences -- does not sound like a present-day P.S. 34 scenario. To make the necessary administrative adjustments will require a very creative and dynamic set of operational managers.

The changeable aspects of the administration/organization variable include:

- the organizational structure itself -- including reporting levels and "charters of responsibility."
- the salary and "competency levels" within the organizational structure; the internal allocation of funds.
- the operating and reporting procedures within the system.
- the transfer of functions to -- and the better utilization of data processing equipment for management visibility and control.

The environment in which this variable operates is extremely political: the "responsetime" required to make a change depends on the specific crisis which is being met and/or the organizational level at which the change is being made. The degree to which operational policies and procedures are under control of the person responsible for their administration depends, again, on the organizational level and the political atmosphere.

Test and Measurement:

The test and measurement function in the educational system is the mechanism by which we determine if we are meeting our objectives. In this section we consider only the test and measurement of the "product", i.e., the student's learning-not the measurement of administrative and management decisions. Implicit in the discussion is the assumption that if "all" of the students in a given school environment perform poorly on valid standardized tests, that the tests are measuring the school/environment "performance" as well as the students' performance. (We include the environment because, as was discussed earlier, the school is not the sole source of student learning.)

Presently, we measure two characteristics of student's learning: (1) the "process" which we call "ability" and seek to measure by standardized I.Q. tests, and (2) the "content" which we seek to measure by Achievement Tests.

The standardized "ability" or I.Q. test measures the "mental age" of the student by comparison with his peers throughout the country. While the process of mental maturation is not fully understood, there seems to be sufficient evidence to show that, in general, an individual's potential "ability" is developed (or not developed) mostly by his very early "learning experiences" in the home arena and, to a lesser degree, in the elementary school. Hence, the I.Q. tests may, at the elementary level be a measure of the degree to which the pre-school and school "learning experiences" have developed the student's potential to do "process" or "abstract thinking."

Achievement tests seek to measure "content," i.e., "what was taught in school." In most schools they are non-standard and left to the individual teacher. This leads to an interesting phenomena: the "quality control," i.e., the testing of the "product" (student learning) and the "producer" of the product, i.e., the teacher -- are one and the same person. The teacher is the one who teaches the subject matter, and then measures whether it was taught well (or whether the students learned it). Hence, she is the measure of her own work. She normally grades (either implicitly or explicitly) on a normal curve, which means that some must "fail" -- and some must "pass." Looking closely at this situation, we find the students (1) pitted against each other for "grades" and (2) pitted against the teacher and her tests; we find the teacher divided between her desire to have the students learn and her "requirement" to pass them on to the next grade. While this system may work well where *both* the teachers and students are highly motivated -- and where the student's parents "play the game," in the situation where all of these conditions do not exist -- it results in a gradual lowering of achievement standards. Our inner city schools are presently suffering from this disease; it is not "the teacher's *fault*" -- if *all* parties do not "play the game," the degradation is *built into the system* and no *one* element can prevent it. (The sociologist might refer to the failure of the parties to "play the game" as "a different value system.")

While it is beyond the scope of this paper to "solve" the problem (thank goodness), it would be interesting to investigate the effects of (1) using the teacher's tests only to diagnose individual student problems, i.e., not to "grade" the student, but rather to help "guide the learning process."

(2) develop standardized achievement tests to be used in an ungraded school system; the tests being "administered" by the "system" and not by the teacher.

While this concept may have its short-comings -- at least it puts the students and teachers "on the same side of the fence," working together toward a measurable goal.

The aspects of the "test and measurement" variable which can be changed include:

- test complexity.
- "parameters" being measured.
- absolute standards vs. normative testing.
- relocation of the test and measurement responsibility.
- standardized vs. non-standardized achievement tests.

Test and measurement is a very sensitive issue in education: with respect to greater standardization -- because the summation of student results will serve as a measure of the teacher and school, the teachers and administrators will not welcome it; because of the probable "rise in standards," the "remoteness of the tester" and the teacher's influence, the students will not welcome it; because it will "prove" what we already know (but prefer not to admit) about some of our schools, the public and politicians will not welcome it; and then there is the very legitimate reason that the information can be misused to "predestine" the graduates of certain schools to mediocrity despite their individual capabilities.

The "response time" of change depends on the magnitude of the change. Once the decision is made, it would probably take several years to develop and validate test instruments: in the light of the previous discussion, any "decision" which would significantly affect the system would have to be made at a fairly high, probably legislative level.

Budget :

The educational budget as used here includes money from all possible sources: Federal grants, foundation grants, state and local taxes, etc. Much of this money is constrained as to how it may be used; the amount provided for the school system is not a parameter over which the educational system has control. It is therefore an exogenous variable which places constraints on what can be accomplished: the problem for the "director" of the educational system is to allocate this money within the system of endogenous variables outlined above, so as to get " the most education per dollar."

Occupational Clusters :

As discussed previously, the occupational clusters, projected into the future, provide part of the basis for "what should be taught:" they are exogenous variables providing guidelines for the educational system in that area of curriculum which is "world of work" oriented.

The above paragraphs have sought to consider some of the variables in the educational system in the light of "what is it about these elements that might be changed or manipulated in order to change (improve) the educational system." Our purpose was to begin to structure a framework for understanding the intra-relationship of the variables which comprise the educational system. Obviously, a great deal more could be said about the "dynamics of change" of each of the variables.

The significant inferences can be made from the above discussion: First, the "response times" of the variables (as the system presently exists) indicate that a planning lead time of at least 8 to 10 years is necessary -- reacting to sudden crises will be very inefficient and probably have little effect; (2) an in-depth understanding of the dynamics, motivations and "perspective" of each of the variables must somehow be represented in the Educational Policy Research Center.

PARAMETER INTERRELATIONSHIPS

In the previous section we considered the variability and "dynamics of change" of some of the major parameters in the educational system; in this section we will discuss some of the interrelationships between these variables. The purpose of this discussion is to focus on the fact that policy decisions and education planning affect a very complex network of interrelated variables -- that we cannot make significant changes in any one of these variables without preparing for the impact on the other variables. In fact, one might question whether it is possible to change the output of the system by changing just one variable, that is -- whether changing one variable might not create such an imbalance in other parts of the system, that the other variables simply "absorb" the "benefits" of the change and the overall affect on the system is (1) internal confusion and (2) negligible in terms of the affect on the output. One might ask, then: to what degree has the "single variable approach" been responsible for the failure of the system to respond to its "designer's" aspirations?

Figure 4.5 illustrates the concept of these system intrarelationships. It is not necessary to belabor the complexity of these intrarelationships; we will simply trace a "single thread" example through the chart in order to provide a basis for our conclusions at the end of this section and in the next section -- "Implications for a Policy Research Center."

We have discussed in a previous section the concept of using "occupational clusters and societal needs" as providing two major criteria for "what is to be taught" (or better -- what "learning opportunities" should be made available) in the schools; the upper right hand corner of Figure 4.5 shows this as the "point of entry" into the "system." (The term "occupational cluster" is used very broadly here to include "what people will do," not just "what people will do to earn a living;" hence, we might have a "leisure cluster.")

The "occupational cluster and societal needs," then, provide a basis for the "curriculum," for the "student test and measurement," and for the "counselor's knowledge" requirements. The "curriculum" ("what is to be taught"), then, provides a basis for "teachers subject knowledge requirements" and as one of the criteria for "instructional strategy" (i.e., how do we teach -- requirements for laboratory facilities, individualized instruction, etc.). The "instructional strategy" will then provide a basis for estimating "teacher knowledge of media and methods" requirements and for projecting the roles of teachers, teachers' aides, etc. The "teachers' knowledge of subject matter," and the "teacher's role in the instructional process," provides the basis for "teacher training requirements (curriculum)." This in turn provides a basis for "instructional strategy" for teacher training, pre-service and in-service; which, in turn, is one of the criteria for "teacher training facility requirements."

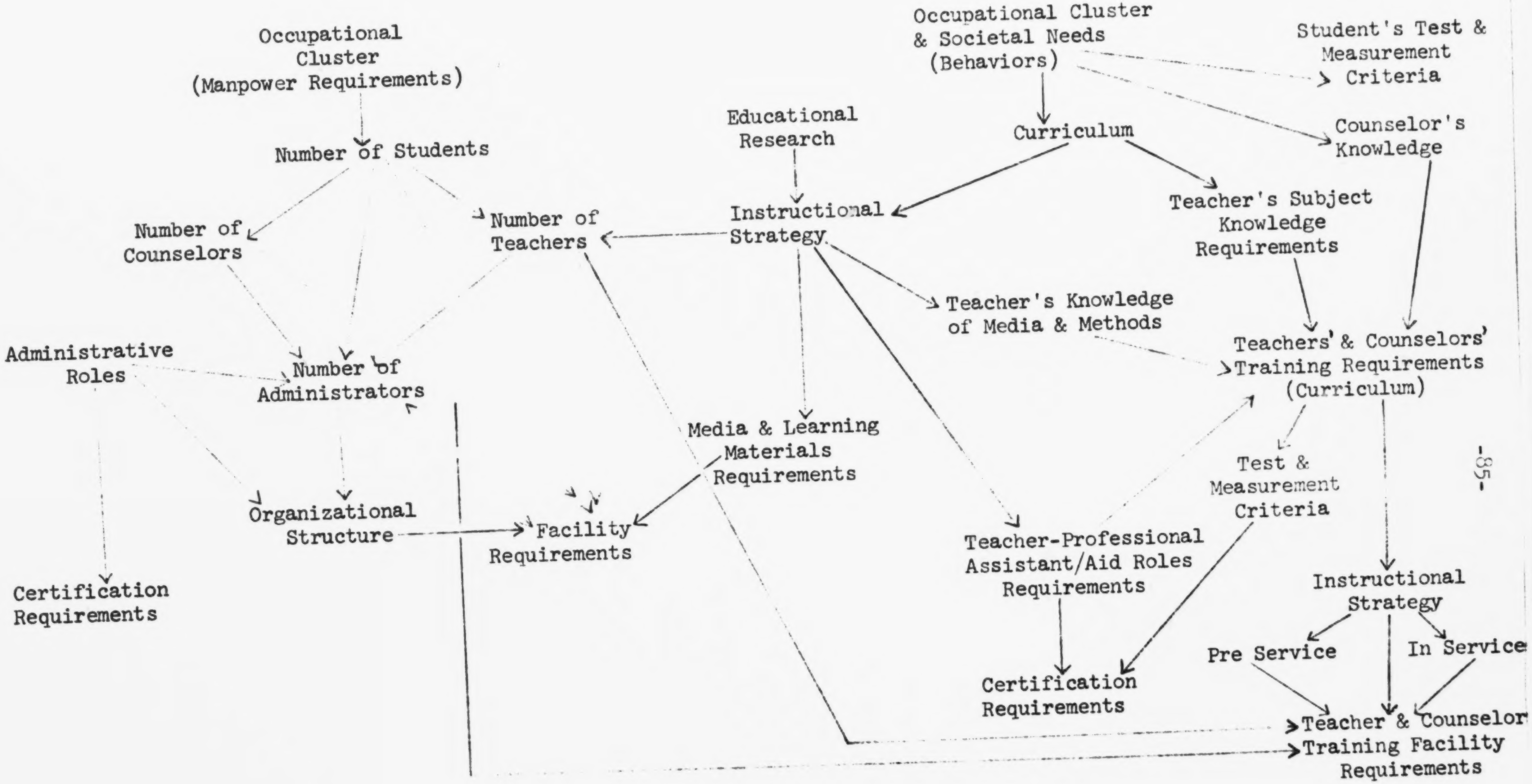

Occupational Cluster (Manpower Requirements)
Number of Students
Number of Counselors
Number of Teachers
Administrative Roles
Number of Administrators
Organizational Structure
Certification Requirements
Facility Requirements
Educational Research
Instructional Strategy
Media & Learning Materials Requirements
Occupational Cluster & Societal Needs (Behaviors)
Curriculum
Student's Test & Measurement Criteria
Counselor's Knowledge
Teacher's Subject Knowledge Requirements
Teacher's Knowledge of Media & Methods
Teachers' & Counselors' Training Requirements (Curriculum)
Teacher-Professional Assistant/Aid Roles Requirements
Test & Measurement Criteria
Certification Requirements
Instructional Strategy
Pre Service
In Service
Teacher & Counselor Training Facility Requirements

Figure 4.5

EDUCATIONAL SYSTEM INTRA-RELATIONSHIPS

This process may obviously be carried out at various levels of detail depending on the types of decisions which it is to support; the terms "curriculum" and "instructional strategy" carry a different connotation to the school principal or college president, than they would to the national policy maker. For example, at the national planning level: the national health goal might indicate a very rapid increase in manpower requirements in the medical cluster by, say, 1975. From this, the educational policy maker might hypothesize the goal: to educate, in accordance with existing and traditional academic standards, the manpower required to meet this health goal. This would reflect into requirements for more and different courses of instruction at various levels within the school curriculum structure based on the projected increased quantity and perhaps on the projected redistribution of roles (cluster competency levels) within the medical cluster.

In addition to the direct occupational cluster requirement for people in the health services field, meeting the health goal may also require additional "courses" in hygiene, etc. so that individuals will be made aware of basic health concepts.

Based on all of these additional course requirements, we may estimate the future requirements for, say, biology teachers, chemistry teachers, anatomy teachers, etc.; we may also note that some of these courses require special laboratory facilities, "internship", etc., and that some major parts of the courses submit well to large group instruction through film or TV media. Using Figure 4.5 as a guide we now have a basis for estimating the cost of, and impact on the following:

1. The number of additional teachers required; the teacher training requirements in various subject areas; the teacher training requirements in terms of effective utilization of media (e.g., the laboratory equipment, etc., which will be required for teacher training); the preservice and in-service training possibilities and the required increase in teacher training facilities.

2. The amount of additional and new learning materials required; the cost of development and implementation.

3. The additional student facilities required in terms of classrooms, laboratories, and new media.

4. The continuing operating costs in terms of additional teachers, faculty facilities, and additional administration.

When the cost of implementing the hypothesized education goal is made explicit, and the impact in terms of educational system parameters is made known -- the goal (or policy) may have to be modified. For example, if implementing the initially "suggested" policy required that, say, "10,000 biology teachers be trained within the first year," the requirement is clearly outside the "response time" capability of the teacher variable and the policy would have to be modified. The modified version would then receive the same analysis. When a practical policy was finally evolved, we would have not only a good policy, but also some indication of what action -- in terms of system variables -- must be taken to implement the policy.

The intrarelationship of variables in the educational system is very complex; some of these relationships can be quantized, (e.g., student-teacher ratios by subject area); some cannot. Making these variables and their intrarelationships explicit will insure that all factors are taken into consideration in estimating the implications of alternate educational policies in terms of cost and effect on educational system parameters (including whether these variables can "respond" within the time constraints of the policy).

Looking at Figure 4.5, the organizationally oriented mind would ask how each of the variables are represented organizationally in the system -- i.e., what organizational entity is responsible for each of the functions on this chart, and what are the media for communication between these elements. Some of the required "intravariable" communications links do not exist today; some are very informal. These facts have significant implications for a Policy Research Center as will be discussed in the next section.

CONCLUSION

We have considered the general concept of a systems approach, the process and its basic elements. We have considered its application to the problems of education and reviewed briefly the state-of-the-art in applying mathematical models to education planning. We have attempted to structure a conceptual framework for the system under consideration by establishing the boundaries of the system, the significant variables in the system which may be manipulated to better meet the system goals, the variability and the interrelationship of these variables. The purpose of this section is to state some of the general conclusions that may be drawn from this discussion; in the section which follows, we shall discuss the specific implications for the design of an Educational Policy Research Center.

Some conclusions, then:

- That the educational system can best be characterized as an "open loop system" (i.e., it does not adjust its behavior based on comparison of its output to a standard or goal); that to make the system into a"closed loop" system will require the development and implementation of measurement instruments and standards or goals to provide the necessary feedback.
- That regardless of whether the educational system is an "open loop" or "closed loop" system, a "system approach" may be used in its"design" (or in the "design of its evolution").
- That a systems approach to educational system planning does not now exist; that a great deal more effort is needed in the area of problem structuring to establish the specific areas where research is required and where data collection is necessary. That a systems approach would provide an orderly framework for the collection of the information needed to "manage" the system.
- That many of the intervariable "communication links" essential to a systems approach do not now exist; that a systems approach will tend to make these missing links apparent.

- That, at least in the area of "work-oriented learning", there is a need for external guidance to the curriculum requirements; that projections must be at least 8 to 10 years in advance in the light of the response times of variables even if a management/administrative environment is created in which change is "allowed".

- That socio-economic projections and/or goals, together with "requirements" for individual fulfillment, provide the basis for the synthesis of alternate futures, the analysis of the impact of these "futures" on educational system parameters, and the resultant educational system policy and planning decisions.

- That there are few (if any) forces built into the system that would motivate individuals to increase the efficiency of their operations.

- That a systems approach to the design of educational systems appears to be feasible; that most "resource allocation" parameters can be quantified and/or ratios may be developed which will provide information with sufficient accuracy to permit the relative evaluation of alternative "futures"; that parameters which cannot be quantized for mathematical manipulation must be made explicit in a broader "decision model".

- That because of the inability to quantize some essential parameters; because of the highly decentralized nature of the system, and because of the "communication gaps" in the present system, a "systems nucleus" concept for the Policy Research Support Center (discussed in detail in the following section) is imperative.

- That the "school" system only contributes to the "learning" of the individual; there are limits to the contribution it can make in various environments' (this is particularly significant in the early learning stages of development where much of the "process" capability is developed) the school must accept as "input" -- and work from this point of departure -- the preconditioning and continuing environment of the students.

- That an integration of educational research and development is essential to educational system planning and policy decision-making; this function (R & D) will not only affect, but should be affected by, all policy and planning decisions.

- That a systems approach will initially be nothing more than a systematic approach; that it will take several years before reliable measurement instruments and feedback channels are evolved in a highly decentralized educational system.

V. IMPLICATIONS FOR POLICY RESEARCH CENTER

In the previous sections we have considered the concept of the systems approach and its application to education: we have attempted to structure the boundaries of the system under consideration in the pilot study and to consider the variability of the variables and their interrelationships in the system. Our purpose has been to develop the concept of the systems approach in a socio-economic, educational framework and to provide specific examples of the process in terms of educational system parameters. The purpose of this section is to discuss the implications of this concept for the design of a Policy Research Center.

As a point of departure for this section, it is necessary to define the purpose of an Educational Policy Research Support Center. This we shall consider to be: "to support educational policy decision-makers by (a) synthesizing -- based on projections and goals -- probable social and economic futures, (b) analyzing these alternate futures and/or potential education policy to determine their implications in terms of educational system parameters and (c) disseminate information in accordance with policy decisions -- in terms of educational system parameters. Based on this definition of purpose, the following paragraphs consider:

(1) the scope of activities in which a Policy Research Center must involve itself in order to fully meet this purpose.

(2) the concept of the Center as a small nucleus of senior, systems-oriented "specialists."

(3) a functional organizational concept of the Center.

(4) an operational concept of the Center in terms of how it would acquire "inputs" and how it would disseminate its "findings."

In the last analysis, an operation which is to meet the above stated purpose within the framework of a functioning democracy must be allowed the maximum possible freedom -- limited only by its charter of responsibility and the fact-finding, socially responsible attitude of its members. The organization, then, will tend to "find its own place and its own contribution" based on the personalities and competencies of its constituents. This section, then, is intended to provide guidelines for the initial structuring and staffing of the Center; the configuration assumes a systems approach is to be taken to the problems and suggests concepts which are an outgrowth of this assumption.

SCOPE OF INVOLVEMENT

Figure 5.1 illustrates the scope of functional activities in which the Center must involve itself in order to develop and disseminate realistic educational policy which is (1) based on probable futures, (2) achievable in terms of educational resources, (3) enunciated in terms meaningful to education, and (4) properly promulgated.

The chart shows the "process" beginning with enunciation of economics, social and individual fulfillment goals and the translation of these into potential requirements or "the challenge" for education. This "challenge" provides the basis for the synthesis of alternate educational "responses"; these possible responses are then analyzed in terms of their impact on educational system resources -- in the light of the number of students for which "educational opportunities" are to be provided and in the light of educational innovations (applications of technology, etc.). After sufficient iterations of this process have evolved realistic policy, the information in terms of impact on specific variables is disseminated (e.g., "requirements for more science teachers in the next 10 years", etc.).

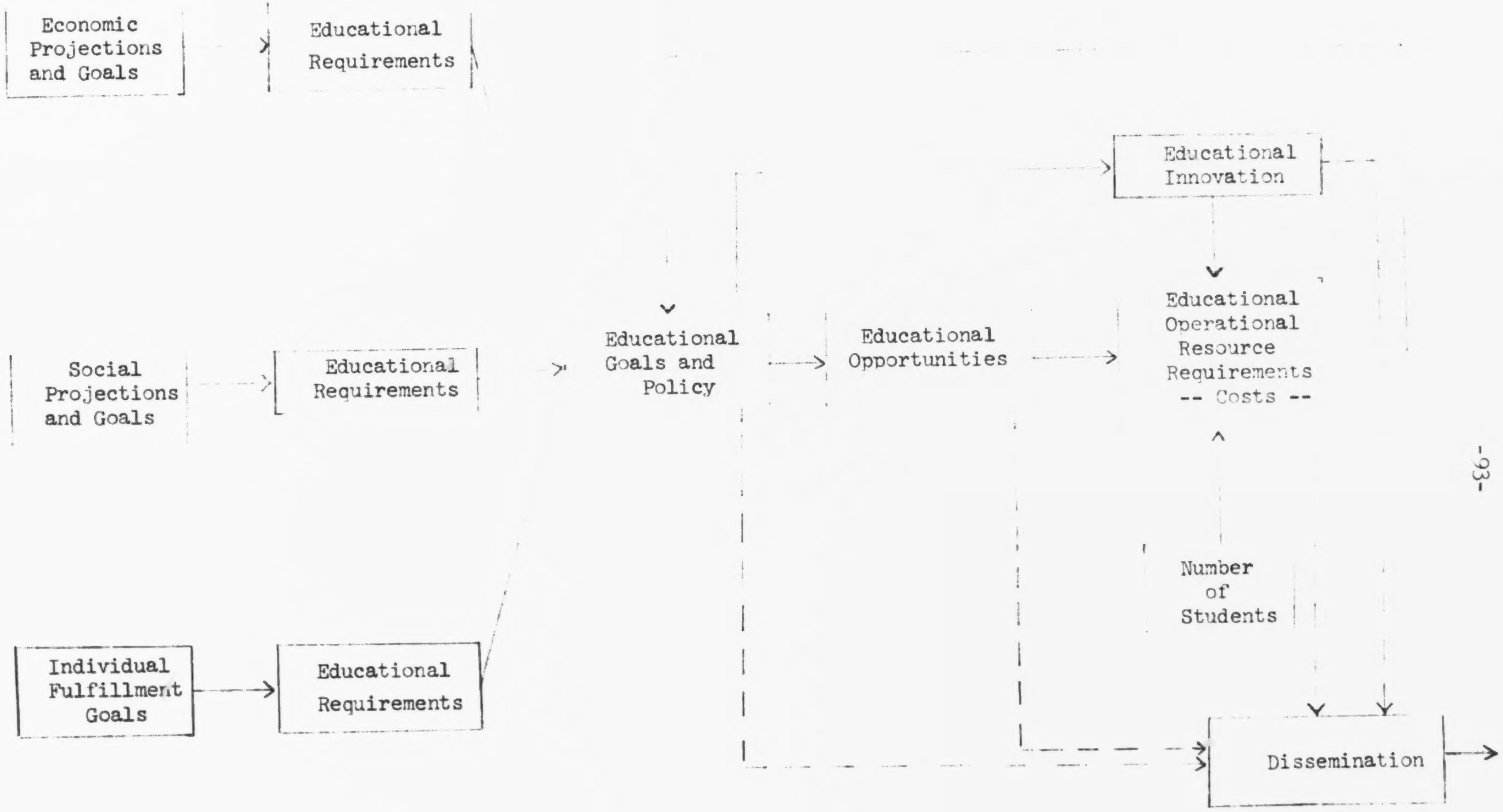

Economic Projections and Goals
Educational Requirements
Social Projections and Goals
Educational Requirements
Individual Fulfillment Goals
Educational Requirements
Educational Goals and Policy
Educational Innovation
Educational Opportunities
Educational Operational Resource Requirements
-- Costs --
Number of Students
Dissemination

Figure 5.1 Educational Policy Research Center
Scope of Involvement

In addition to illustrating the analysis of futures in terms of operational system resources, Figure 5.1 shows an "evaluation and policy analysis loop" which includes educational R & D (shown as Educational Innovation). The diagram shows the R & D being "evaluated" for its actual impact on operational educational system resources, and the results of this evaluation being "fed back" to provide a basis for educational R & D policy. It is suggested here, therefore, that the Center should involve itself in a systematic way, not only with the operational system, but also with policies that will guide educational R & D to the solution of real operational problems.

The final factor to be discussed with regard to Figure 5.1 is: dissemination. A glance at Figure 4.5 recalls the complex intravariable relationships and the lack of some critical communication links; couple with this the diversity of decision-making levels involved and demographic and environment factors which will enter into some decisions at lower levels -- and we begin to focus on the problems of dissemination. Two facts are suggested:

(1) the output of the Policy Research Center should not take the form of thick "yearly" reports, and

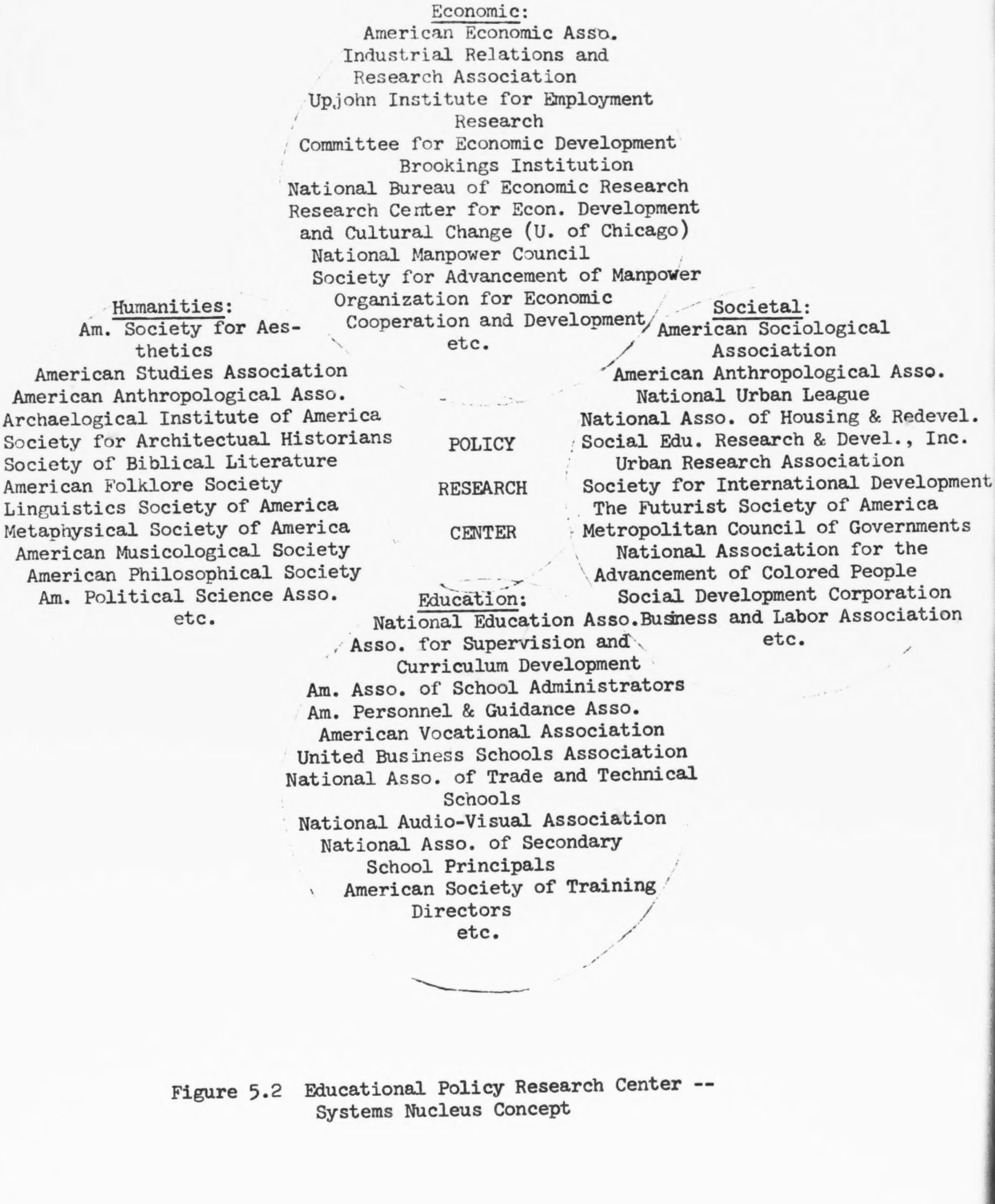
(2) the information to be disseminated should be in the terms which the user can understand and take action on -- i.e., in in terms of educational systems variables.

The problem of dissemination is discussed in greater detail below under "Operating Concept -- Output."

SYSTEMS NUCLEUS CONCEPT

As we have seen, the breadth of the problem to be "solved" by the Policy Research Center spans every facet of human activity. Not only is the "subject matter" diverse, but the implementation of policy decisions requires the "commitment" of the human community -- at many levels of "management" in many social and economic areas and in many and diverse demographic areas. The diversity of interests which must be considered, both in the formulation and in the implementation of the policy, suggests the concept of the Policy Research Center as a small group of senior systems-oriented "specialists" which provide a nucleus interfacing with many individuals and professional societies concerned with humanistic, societal, economic and educational developments. Figure 5.2 illustrates this concept and shows typically some of the organizations which the Center would seek to involve -- especially in the "projections and goals" and the "educational requirements" blocks of Figure 5.1.

The Resource Center would be involved in both formal and informal information exchanges with these groups through small group meetings, seminars, solicited and unsolicited position papers and through the appropriate normal publications of the groups. In general, the Center would provide the "problem structuring," the "integration" and the cost-effective evaluation of the concepts and positions of these various groups and interests. These same groups would also serve as a channel for dissemination where appropriate.



Economic:
American Economic Asso.
Industrial Relations and Research Association
Upjohn Institute for Employment Research
Committee for Economic Development
Brookings Institution
National Bureau of Economic Research
Research Center for Econ. Development and Cultural Change (U. of Chicago)
National Manpower Council
Society for Advancement of Manpower
Organization for Economic Cooperation and Development
etc.

Humanities:
Am. Society for Aesthetics
American Studies Association
American Anthropological Asso.
Archaelogical Institute of America
Society for Architectual Historians
Society of Biblical Literature
American Folklore Society
Linguistics Society of America
Metaphysical Society of America
American Musicological Society
American Philosophical Society
Am. Political Science Asso.
etc.

POLICY

RESEARCH

CENTER

Societal:
American Sociological Association
American Anthropological Asso.
National Urban League
National Asso. of Housing & Redevel.
Social Edu. Research & Devel., Inc.
Urban Research Association
Society for International Development
The Futurist Society of America
Metropolitan Council of Governments
National Association for the Advancement of Colored People
Social Development Corporation
Business and Labor Association
etc.

Education:
National Education Asso.
Asso. for Supervision and Curriculum Development
Am. Asso. of School Administrators
Am. Personnel & Guidance Asso.
American Vocational Association
United Business Schools Association
National Asso. of Trade and Technical Schools
National Audio-Visual Association
National Asso. of Secondary School Principals
American Society of Training Directors
etc.

Figure 5.2 Educational Policy Research Center -- Systems Nucleus Concept

ORGANIZATIONAL CONCEPT

Figure 5.3 illustrates a concept and for the internal organization of this nucleus, the figure shows functional groups and indicates typical responsibilities for each group.

One basis for organizing and staffing a new operation is to have the organization "simulate" the problems which it is to solve. Hence, the "variables" of the educational system which we discussed should be "represented" in the Center organization. If decisions are being made which will affect teachers, administrators, et al., their "point of view" should be represented in the group. It is also necessary since the nucleus center is to interface with senior professional people in the various professional societies, that the Center contain a comparable professional competence; i.e., not only the potential communication problem (semantics and professional "jargon" problem), but also the need for"acceptable " personnel must be recognized.

With regard to Figure 5.3, the "projections" function would provide the primary interface with the professional organizations in formulating the social, economic and individual fulfillment goals for education in the future. These people would primarily be responsible for the synthesis of alternate futures and/or policies.

The education group would require a rapport with "the educational establishment" and the semantics of this community; they would be responsible for the interface with the educational research; they would be experts and sources of information for "elements of cost", et al., within the educational system: they would "represent" the "positions" of the education system variables when value judgments involving these variables are an issue; they would be responsible for the definition of the educational cluster content. This group would not necessarily do all of these things; but would see to it that the required information is available to the analysts and that the "views" of the variables they represent are reflected into the Center's analysis process.

The "projections" function and the "education" function might be viewed as primarily "content-oriented"; the analysis group would be concerned with the "process" of evaluation and decision-making. The responsibility of this group would be to structure and process the information so that all significant variables are taken into account (quantitatively if possible, by relative figures of merit, or by explicit assumptions). The analyst is primarily concerned with processing the "alternate futures data" in terms of its impact on educational system parameters and costs -- in a logical, consistent and intellectually honest manner which recognizes the boundaries and constraints of the system.

As the projections, requirements, goals and educational system are continuously analyzed, policy "trends" will evolve; the responsibility of the dissemination group is to insure that appropriate information, in appropriate terms and levels of detail, is communicated to appropriate people.

It is not so much the policies that need to be disseminated -- (these will probably never evolve as single clear-cut statements) -- but rather the "impact trends" on educational system variables which must be communicated. This fact, coupled with the complexity of the educational system decision process, the intravariable relationships, and the need for a multi-variable approach, suggest that the Policy Research Center should not simply publish voluminous semi-annual reports of its "findings." Dissemination is a continuing process, utilizing any and all media of communication to reach all levels of decision-makers; the objective is to influence social "force fields" -- not to make policy proclamations. Some of the methods of dissemination are discussed in the next section; our purpose here is to outline the responsibilities of the dissemination function within the organizational concept. These responsibilities would include the selection of media, the editing and production of material, the interface with magazines and publications (both to publish the Center's materials and to act as a catalyst in encouraging publishers to generate their own materials -- using Center data if appropriate), the determination of the appropriate persons, groups and levels at which information is to be communicated, the accumulation of a "library of published materials" to insure maximum utilization of acticles which are written by the Center staff, and the "user feedback." By "user feedback" is meant that the dissemination group is responsible for determining if the information being disseminated is, in fact, useful to, being used by and in a form which is useful to, the people for whom it is intended.

The administration function within the Center is a very significant one. Because of the nature of the interface with external groups,

Advisory Board

Program Manager

Secretary

- Project Coordination
- Marketing

Analysis

- Analysis - Problem Structuring
- Analysis - Mathematics
- Information Systems
- Directed Research

Projections

- Economic Projections/Goals
- Societal Projections/Goals
- Individual Fulfillment Goals
- Directed Research

Education

- Education Research Interface
- Education Resources Specialist
- Education System Dynamics
- Occupational Cluster Analysis
- Directed Research

Dissemination

- Distribution - Media Selection
- Editing and Production
- Dissemination Techniques
- Dissemination Personnel/Offices
- Dissemination "Library"
- User Feedback

Administration

- Project Planning and Reporting
- "Consultant" Contracts
- Workshop, etc., Planning and Arrangements
- Subcontracts
- Financial Accounting
- Facilities

Figure 5.3 Educational Policy Research Center Organization

many seminars, workshops, etc., will have to be arranged, as well as many "consulting contracts." The responsibility of the administration function is to insure that these operations run smoothly and effectively utilize people's time. This function is responsible for project planning and reporting, facility requirements and internal financial accounting.

In addition to the projections, education, analysis, dissemination and administration functions, the program manager would be supported in an advisory capacity by an advisory board formed of community leaders and/or outstanding specialists. This group would "rotate" its membership, and review the Center work, progress and plans on, say, a semi-annual basis.

OPERATIONAL CONCEPT

Figure 5.4 illustrates a concept of operation for a Policy Research Center which utilizes the systems nucleus concept and seeks to implement the functions outlined in the previous section. The discussion is centered around the methods which this group might use to interface with the various individuals and professional groups in "collecting" their views and opinions, and the methods which might be used to disseminate the results of the Center's "findings."

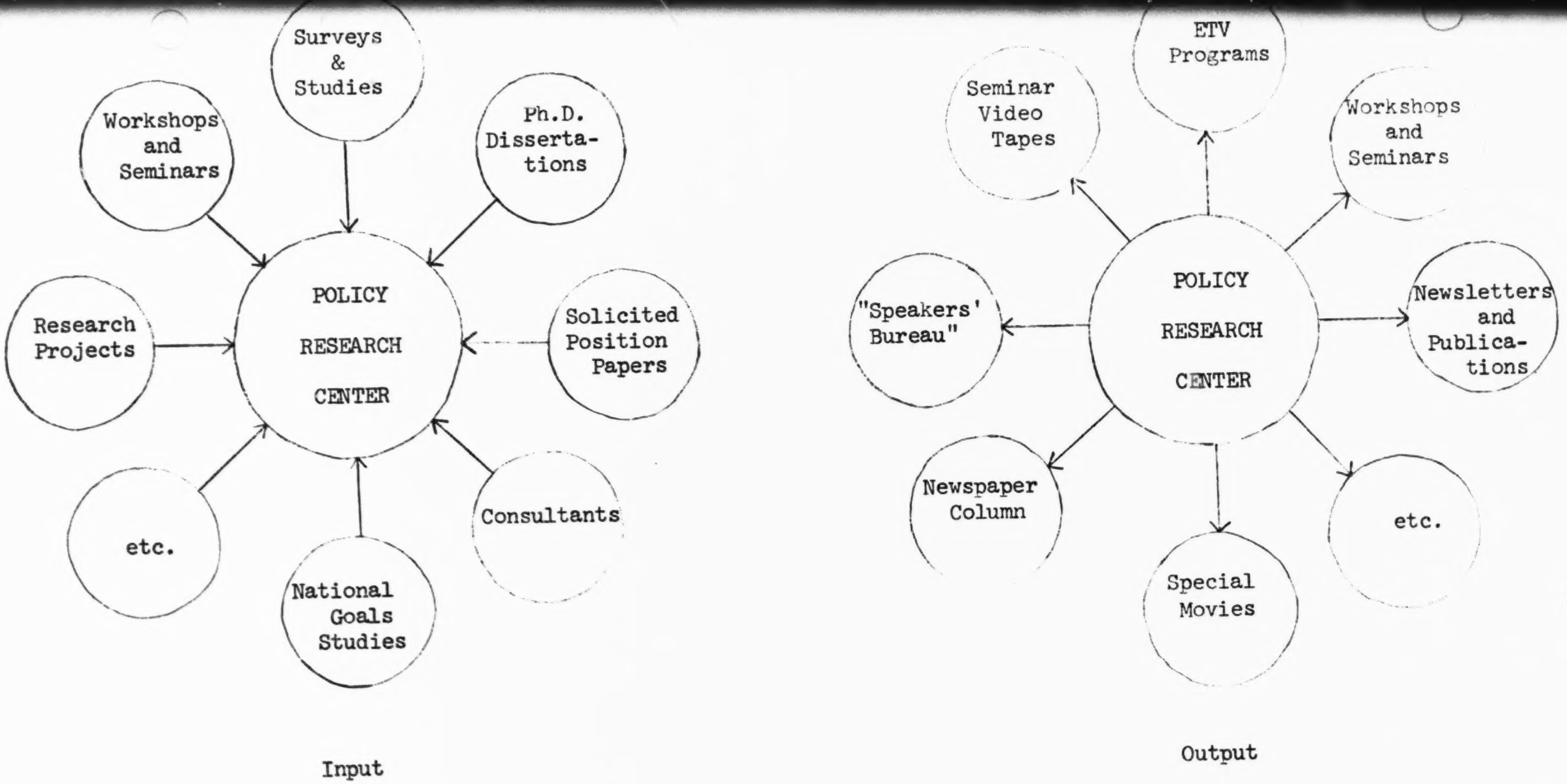
The Center is shown as getting "inputs" for projections and analysis from such sources as:

- sponsoring and/or attending seminars and workshops comprised of the members of the various groups shown in Figure 5.2. Generally, the Center-sponsored activities would be "directed research," that is, specific subject papers would be requested of specific individuals to provide a point of departure and framework for the discussion of selected groups. In some cases, parts of these discussions might be video-recorded for dissemination via ETV, and/or "white papers" on commercial TV.

- specific surveys and studies conducted under the direction of the Center, as well as analysis of surveys and studies made by other groups.
- review and evaluation of appropriate research projects being conducted by others.
- provide a list of "needed research" to universities and colleges and encourage Doctoral dissertations to be prepared on these subjects; structure the problems and required research at a level which is reasonable for this purpose and with sufficient specificity to acquire information for educational systems planning. These could be for methods and technique development, as well as for "content" research. Schools of Education, Systems Engineering, Operations Research, Urban Development, etc., could be used as sources.
- solicited position papers from individuals, and professional groups.
- the review and analysis of national goals studies, etc.
- specific discussions and work reviews with consultants specializing in specific problem areas (inner-city conflict, remedial education, etc.).

The Center would strive to integrate and structure the insights and information gathered from sources such as these and use the information as a basis for projections, for hypothesizing goals, for the analysis of impact and as the basis for additional "directed research."

As was discussed previously, the output, or dissemination of the Center should not take the form of periodic voluminous reports; on the contrary, the dissemination function is viewed as a continuing process of


Workshops and Seminars
Surveys & Studies
Ph.D. Dissertations
Research Projects
POLICY RESEARCH CENTER
Solicited Position Papers
etc.
National Goals Studies
Consultants
Seminar Video Tapes
ETV Programs
Workshops and Seminars
"Speakers' Bureau"
POLICY RESEARCH CENTER
Newsletters and Publications
Newspaper Column
Special Movies
etc.

Input

Output

Figure 5.4 Educational Policy Research Center Interface Operation

"influence." Some of the methods which the Center might use are illustrated in Figure 5.4 as "output." These include:

- Use of ETV programs to present panel discusssions; "the world tomorrow," "you and your schools" programs which dramatize both the problem and the proposed action -- in terms of educational system variables.
- Use of workshops and seminars; bring, say, state board of education officials in contact with community leaders in a "structured problem environment;" the Center acting as catalyst.
- Newsletters published by the Center.
- Magazine articles by members of the Center staff -- this should be a continuing program at all levels and in all major channels of communication used by the persons for whom the message is intended.
- Special movies -- available for non-Center-sponsored seminars and workshops -- as well as PTA, etc., meetings.
- Through a "speakers' bureau" both within the Center, where staff members have "prepared speakers" available, and "outside" the Center, wherein the Center maintains lists of appropriate speakers and provides recommendations to inquiring groups.
- The possibility of a syndicated newspaper column on educational problems might be considered.
- The use of video-tapes of Center activity proceedings -- or of special video-tapes prepared by staff members' discussions of specific problems -- prepared at the request of users for specific occasions (for example -- their own seminars).

These examples of dissemination techniques are illustrative rather than exhaustive. They are meant to convey the concept of dissemination as a continuous, creative, imaginative process of influence.

CONCLUSION

The Center concept which has been discussed in this section is based on the assumption that the Policy Research Center is to take a systems approach to a very complex problem. There are probably many Center concepts which will "work:" it is important to select one which is logical, consistent, and administratively feasible. It is extremely important that the Center be staffed by senior, competent, creative people who have a strong personal commitment to this problem and who can work within the framework of an interdisciplinary team.

The next step is commitment - then action.

FOOTNOTES

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2. Ibid., Paul Alper, "Part V: Introduction of Control Concepts in Educational Planning Models", pp. 259-273.

3. Ibid., Jean Benard, "Part IV: General Optimization Model for the Economy and Education", pp. 207-244.

4. Ibid., Hector Correa, "Part II: A Survey of Mathematical Models in Educational Planning", pp. 25-57; 69-75.

5. Ibid., pp. 79-85.

6. Herbert S. Parnes, ed., "Planning Education for Economic and Social Development", The Mediterranean Regional Project, Organization for Economic Co-operation and Development, September 28, 1962.

7. National Education Association, Center for the Study of Instruction, Rational Planning in Curriculum and Instruction: Eight Essays, John I. Goodlad, "The Curriculum", pp. 5-31.

Changes in Educational Technology and Their Implications for Education in the Next Two Decades

by

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CHANGES IN EDUCATIONAL TECHNOLOGY AND THEIR IMPLICATIONS FOR EDUCATION IN THE NEXT TWO DECADES

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CHANGES IN EDUCATIONAL TECHNOLOGY AND THEIR IMPLICATIONS FOR EDUCATION IN THE NEXT TWO DECADES

PART I

EDUCATIONAL TECHNOLOGY: PAST, PRESENT AND PROSPECTS

An Introductory Perspective

Prognosticators indicate that the greater proportion of 1980's 240 million people will be living in far greater urbanization than we conceive today; and, the greatest growth of that population to the 300 million mark of the year 2000 will be within the swelling suburban rings whose growth will outpace central-city growth. Nearly 80 percent of the 1980 population will be urbanized, and fewer than 10 million of the 240 million will be producing food on farms which will have become corporate enterprises. Increased mobility will mark both business and pleasure. Advanced sophistication of technology will mark its application in both production and social areas while productive capacities will multiply the number of finished product alternatives from which to choose, and thus, diversity will be at least as important as uniformity.

The supply of information will continue to expand exponentially while the demand for it will similarly increase. Therefore, there will be a growing need for communications devices and systems to which the population will expend a much greater part of its attention and time. Communication will be particularly important in the interlocking relationships of organizations and agencies, government and otherwise; inter-agency agencies, inter-government cooperation, and government cooperation with nongovernment agencies will augment the need for highly effective communications systems. Huge organizations will wage and exert more clear powers and influence; people will find expression through becoming members of these huge organizations as they increasingly realize their tendencies to organize and get things done through affiliations and associations in which they gain force and meaning.

People will respond very well to their new roles in a new social environment in which increases in the demand for technical personnel and technical process will command central attention. Technicians, above the sub-professional workers and yet below the scientists, will adjust to improvements that will provide them with greater leisure time and the opportunity to remain individuals within their society. In education, the move toward individualization will emphasize the use of technology and stress learning at one's own rate and doing things on one's own. It is predicted that much more education will take place in the homes, particularly in higher education. Traditional institutions may become anachronisms as learning takes place at home via telecommunication, assisted by computer setups that could enable students to work directly with scholars through a basic home communications center linked to complex, nationwide networks. Yet, most educators don't predict appreciable changes in educational patterns; they foresee increased use of machines and man-machine systems within traditional patterns. Yet dramatic changes must materialize if our educational system is to survive and become viable in the new society ahead of us.

In order to bring about the changes that will be demanded from external sources, education will have to experience a conversion of those external pressures to internal pressures. The impact of technology, and the developments of certain government agencies are good examples.

The fairly powerful work of existing research centers, now strong causes of change, will also need to be internalized and become an intrinsic part of school structure and administrative decisions. Administrators will become planners, and teachers will become developers. Efforts must be made to convert teachers into highly responsible individuals capable of autonomous reactions to new programs, of being highly diagnostic, and of creating learning situations that produce results which are measurable as feedback. Yet, regional laboratories may draw their manpower from trained teachers who become so capable in program production, and the resulting teacher shortage will have to be alleviated by developing programs designed to train sub-professional personnel to become the guidance-oriented teachers that must emerge. Through interactions among all these people, schools need to evolve their own internal research and development function. Another way of keeping institutions more viable will be through having individuals, specialists in various fields, socialized into the teaching profession.

Also promising in the future of education will be development of "teaching packages" with a high degree of reliability and validity. These modular units will consist of textbooks, a series of readings prepared in advance and quite different from the traditional textbook; a teacher's guide, which will list for each day the way material should be presented; and a programmed workbook to go along with the text, as well as with the teaching aides, and all appropriate equipment necessary to carry out lab experiments. There will also be a lab manual for students. The guidance-oriented teacher will administer the contents of the "packaged unit", and the packages will demand that the teacher become more analytical as an interpreter of the feedback which might indicate that further innovations and changes to the package be made, either by the teacher or by its producer. Thus, the teachers will be led into the role of understanding higher relationships between concretes and abstractions, of manipulating variables and of generalizing about basic learning processes; teachers will, in a sense, become theorists as well as experts in mental health and interpersonal communication.

These new teachers will work closely with instructional systems designers and a team of other specialists capable of integrating hardware and software into viable learning situations and processes. In so doing, educators will have to utilize time of professional researchers, scholars, and practitioners through meetings and conference-type activities for idea dissemination.

Education will become increasingly research-oriented as it involves people from other disciplines, and teachers may become the main link with the research and development centers that could provide long-term projects. Certain top schools will initiate their own development units that will produce internally and in which teachers may even help design programs.

To offset personnel obsolescence, teachers may participate in fellowship programs designed to retrain them for emerging roles in school systems in which they will actively involve themselves in the decision-making processes with educational innovations. The role of the teacher-developer will have to be more clearly defined as publishers develop a market for the new instructional materials produced -- public domain and copyright will need to be resolved. Since many tasks of school systems will involve resolution of urban problems, administrators will need to become more politically active. Teachers will need to be capable of evaluating research in these directions, and then function in adaptive mechanisms of the schools. Teachers will work closely with people in behavioral sciences and in journalistic production capacities where experience and ability in technical writing will be essential. They will also work with specialists in research design, instrumentation analysis, communications, video-tape production and transmission, as well as with human relations analysts.

The Confrontation: A Recapitulation

Every day there is more to learn, yet there is less time for learning it. This crucial time constraint must be the mandate for a new education and training technology, for an educational process responsive to, and consistent with, late 20th century challenges. Educational technology seeks to develop a set of axioms to support what must inevitably become a science of education. Technology is the application of what we know -- a science replacing an art. A thriving, robust educational technology must ultimately lead to the development of new, effective, efficient educational systems made up of integrated materials and elements designed to perform specific educational tasks with a high degree of reliability, for a particular group of students.

It is likely that in another ten or twenty years educational and training innovations will have become massive and will be happening fast, and automated instructional systems will have become as common as TV sets and automobiles, providing ideal instruction for every student on an individual basis. If this occurs, its origins will be directly traceable to the innovative murmurs that are presently being heard in the programmed education efforts, computer-based learning, and in the emerging systems thinking and analysis, and in education.

A need for educational technology was highlighted in President Johnson's message of January 12, 1965, to the Congress concerning "Full Educational Opportunity". President Johnson said:

> "Specifically, four major tasks confront us:
>
> 1. To bring better education to millions of disadvantaged youths who need it most.
> 2. *To put the best educational equipment and ideas and innovations within reach of all students.*
> 3. *To advance the technology of teaching and the training of teachers.*
> 4. To provide incentives for those who wish to learn at every stage along the road to learning." (1)

Again, in the section of his message dealing with "regional education laboratories", the President said:

> "I recommend (that we) ... train educational research personnel; *provide grants for research, development of new curriculums,* dissemination of information, and implementation of educational innovations. We are now embarked on another venture to put the American dream to work in meeting the new demands for a new day. Once again, we must start where men who would improve their society have always known they must begin -- with an educational system, *restudied, reinforced,* and *revitalized.*"

Again, the requirement for educational innovation based upon educational technology is emerging from the necessity for change in our educational institutions. This requirement has more pertinence today and more compelling quality than it ever had in the past:

> "Assessment of American education is today a matter of great public concern. Debate on educational issues is not new in America. The current debate, however, is animated by a new spirit of urgency due to an unprecedented foreboding about the

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(1) Italics added.

> future and an unprecedented awareness of human potential for progress. Man's destiny appears to depend upon his acquisition and use of knowledge. Public concern is based, in short, upon a new sense of the relationship between the quality of education and the future of America." (2)

Obsolescence is not the only problem. We have been educating not only increasing numbers of young people each year, but our schools have also been holding higher proportions of them for longer periods. Twenty years ago, about half of our 17-year olds graduated from high schools; now, around 70 percent do. We have been building 65,000 to 72,000 classrooms a year, well above the rate of a decade ago. It is anticipated that elementary and secondary school enrollments will jump from 36 million now to 44 million by 1970. This means that we will require more than 500,000 new classrooms by 1970, a far greater number than will be produced at the current rate, as high as it is. Also, it is argued, we will need 400,000 additional teachers in the next five years.

We will need more and better counselors; stronger programs for gifted students; improved curricula for average youngsters; increased research and experimentation in reading, testing, and learning; more modern vocational programs; and so on. (3)

We do not lack methods, ideas, procedures, or subject-matter knowledge. What we do lack is something substantive in the training of would-be teachers to validate those skills which are successful in modifying the behavior of students. We need both quantitative and qualitative measures of what happens to the student and how he performs. An educational technology of any significance would be able to assess the difference between a successful learning experience and a relatively unsuccessful one. It would do even more. It would delineate several possible explanations of why one experience was successful and another unsuccessful.

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(2) An Essay on the Quality in Public Education, Educational Policies Commission National Education Association, Washington, D.C., 1959, p. 5.

(3) The facts in the paragraph come from "The Fight Over Federal Aid to Schools" Changing Times, The Kiplinger Magazine, February, 1965, p. 43.

An educational technology worthy of the name, then, assists instructors in analyzing the structured learning experiences which fail to teach students. William A. Deterline provides us with some insight into the possible reasons why many instructors find this difficult to do:

> "In many cases even an experienced and skillful instructor will not be able to identify those subtle causes of a breakdown in instructional communication ... Most instructors, whether they are aware of it or not, make use of technical expressions, technical words, complex grammatical structures, and ambiguous or too-terse statements at a level of complexity that is not appropriate for the students ... One difficulty is that the instructor is often unaware of the cause of the breakdown of communication and the basis for confusion ... Most instructors who are proficient in the subject matter .... often are ineffectual in their instructional presentations because they do not know the material from the point of view of effective sequencing for instructional purposes, and/or are unable to be consistent in presenting the material at a technical level that is understandable, and in doing so in small enough steps with adequate repetition, examples, clarifying analogies familiar to the student, and so on." (4)

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(4) William A. Deterline, in a letter to the author, March 1, 1963.

Education and training technology has not been able to keep up with the innovations of technology itself. We must turn with hope to the conviction that the problems created by technology will be solved by technology. Can training truly become a science? Is a science of instruction possible? Can the science of learning be applied to the art of pedagogy? Can the studies of the behavioral scientist concerning the fundamental processes of learning be applied to training and education? If training will always remain an art and never become a technology, what is our alternative? And ultimately, will our desperate need for an educational technology be sufficient in and of itself to create a breakthrough?

Through educational technology, we can package the systems of learning which can be transmitted to students when they need it and where they need it in the most economical and feasible manner. To accomplish this task, we need to develop a technology of education which is based upon knowledge of behavioral communications and instrumentation (media) technology. But more than this, we have to fully exploit what little we know of learning and apply it to the art of teaching. We must critically observe, analyze and assess the pedagogical processes underlying education, and we need to do the same with the teacher, who must manage the processes and instruments of the new education if her role is to be significant in the school of tomorrow.

A. The what and why of educational technology.

No development has provided as hopeful a sign for the revolutionary emergence of educational technology as that started by the efforts of Dr. Sidney Pressey some 35 years ago, temporarily dropped, and dramatically started again by Dr. Burrhus F. Skinner a few years ago at Harvard. It is this development which has been referred to as programmed instruction or automated teaching. Thus, while automation poses a threat to current skills and demands retraining of large segments of the workforce, automated education provides a way out of the quandary. The basis for modern educational technology is found primarily in the work of Skinner and the "Experimental Analysis School of Behavior", which he founded and which lays the foundation for an efficient management of behavior. This approach is process-oriented and its initial formulation led to the concept of programmed instruction, through which craftsmanship became emphasized in the preparation of learning materials. Modern educational technology, based upon the programmed education process offers the possibility for planning and organizing learning resources in such a manner, that behaviorally (i.e., operationally) defined objectives of learning can be reliably attained.

In 1962, the American Management Association published a book which heralded this potential revolution in education and training technology. The book called, Revolution in Training, was a description of the application of programmed instruction technology to a variety of training problems in industry. Both industry and the military have a history of being receptive to new developments in learning methodology, largely because training and education in these establishments have always required results. Inefficient education and desultory training methods are luxuries that neither of these institutions can afford, although, as will be pointed out later, concrete evidence to the superiority of new methodologies employed by the military is still to be forthcoming.

Programmed instruction is the first valid system of educational and instructional technology that our society has ever had. It is patently in error to categorize it, as has so often been done, as simply another teaching medium or technique or to classify it along with the teaching machines, which is to house it among the various audio-visual devices. It is much more. It should be emphasized, however, that the procedures of automated education and the basic principles of programmed instruction, as well as the concepts underlying the thinking of men like Skinner, Bruner, Gagne, and others, who are contributing to the formulation of modern educational technology, do not provide us with any formula for determiningwhat ought to be taught nor to whom it should be taught nor even when it should be taught. The basic contribution is the how of what is being taught and it is this that is such a critical issue.

Basically, then, educational technology is founded upon three subsidiary technologies:

(1) Behavioral technology

(2) Communications technology

(3) Instrumentation technology

Both behavioral and communications technology are what is meant when we talk of "software". Instrumentation (media) technology is meant when we say "hardware". The integration of these three basic areas in a formalized and systematized set of procedures to produce learning, is the underlying framework of educational technology which is, in essence, the applied science of education. Such an applied science requires an operational analysis of the needed and desired behavior, a set of well-defined pedagogical exercises packaged in instruments designated as learning materials, and provided to the student at the most appropriate time. If the proper behavioral analysis is made and the messages of learning are transmitted in adequate instruments, then the thesis is that there is high reliability that the materials will produce the desired learning in the students. It is also predicted that the learning will result within a much shorter time span, with a much greater effectiveness. If appropriate stimulus configurations are planned and tested, they should then be instrumented in a Bessemer-like process so that the best possible learning messages would not have this opportunity. It is for this reason that programmed instruction technology is so basic to the formulation of a viable educational technology.

Through programmed instruction we are raising questions regarding the adequacy of current measures of learning experiences. It has deepened our concern with retention of learning and with the sequencing of instructional content, to mention only a few issues.

Through programmed instruction we are starting to think about applying engineering principles to solving educational problems, not to mechanize education, but rather to develop educational technology to the point where we can shoot with a bullet instead of with rock salt. Programmed instruction has forced us to ponder what it is we are about and to establish quality control for the processes we call education and training.

Try-out students for programmed materials are sought in the circles of rehabilitation, delinquency, dropouts, and reform schools and penitentiaries. Adherents of this technology have said in effect to school administrators, "Give us your failures. Let us try out our programs on the students who have failed to learn." A refreshing change. This attitude, this commitment, more than anything else, will spur the development of educational technology.

There has been an understandable though over-concern with the specific procedures and techniques of programmed instruction itself, and with the accompanying teaching machines. But, if we concentrate on the specific features of this innovation in its present primitive form and process, instead of on its underlying concepts, we are not likely to find in it the solutions to our problems of developing an adequate educational and training technology. Its possibilities as an incipient technology of instruction are more important to us than the excessive deliberations about such temporary features as linear versus intrinsic programming, overt versus covert responses, teaching machines versus programmed textbooks, and so on.

George Kneller, in his address to the American Psychological Association (1961) stated the issue very succinctly:

> "Whether we like it or not, automated teaching is here to stay. Merely to oppose it is futile. Education must mirror the age it strives to improve. It cannot isolate itself from automation any more than from other social or economic changes. For automated teaching is one more of the applications of technology to human life. The question to be asked is not, 'Do we accept automation?' but, 'How much of it and under what conditions?'" (4)

B. Educational technology and the systems approach.

The most recent formulation of educational technology based upon the programmed instruction process is the emergence of the "systems approach" to the design and development of validated learning materials. The increasing technical problems of training humans for what appear today to be superhuman tasks -- exemplified most dramatically in our manned-spacecraft training programs -- require us to look critically to the "systems approach" which has developed in American industry. It is essentially one which demands that we consider all the resources which can be brought together and interrelated specifically to produce a particular result. The outcome of applying the "systems approach" to training will be the design and development of an educational "system" which will produce the desired performance by the trainee.

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(4) Quoted in G.D. Ofiesh, Programed Instruction, American Management Association, Inc., New York, 1965, p. 28.

The "systems approach" attempts to "maximize, in some sense, the expected value". (5) A system is a set of integrated elements designed to elicit demonstrated phenomena as efficiently and reliably as possible. It is a package whose every element has a specific function in producing the desired outcome. Programmed instruction itself can be a system; it also may be part of an over-all system which will include programmed instructional materials as sub-elements. A "systems approach" is applied to the solution of a problem when its various elements can be defined, maintained, and manipulated toward the achievement of its objectives -- in this case, solving the problem.

The "systems approach" is a term that refers to the organization, procedures and schedules that are set up to apply principles of educational technology to the development of the learning systems. The "instructional system" is the combination of media and methods that constitute the total instructional environment in which the student functions. The student, an integral part of the system, interacts directly with the other components. The total system interaction that is referred to is the "learning system".

Educational technology, therefore, is the process underlying the collection of concepts, principles, techniques, processes and instruments (media) that are applied by the systems approach to the development of effective learning materials. Many functions can be carried out by a number of people, in specific ways and with the proper interactions, if the most effective and efficient learning system is to be developed and maintained. The organization, scheduling, specification, and operation of these functions requires the development of an operating system. The relationship of this to a school system is obvious. Through the systems approach, we can identify every component of the system and its specific operation and contribution to learning. What is needed is a broadening of the concept of both educational technology and the underlying principles of programmed instruction.

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(5) H.H. Goode and R.E. Machol, Systems Engineerings, McGraw-Hill Book Co., Inc.,New York, 1957, p. 313.

The fundamental steps in developing a learning system are defined by Robert Mager:

> "A learning system is a structured sequence of instructional events which has been tested and validated on a sample of the trainee population to accomplish a specified change in competence with optimum effectiveness and efficiency.
>
> Specifically, the concept is delineated by the following boundaries:
>
> 1. A learning system emphasizes the importance of the individual learner. Instructional material is presented to him in accordance with his needs, starting at his current state of development and carrying him to the desired performance level.
>
> 2. The final criterion for the effectiveness of a learning system is the performance of the learner. Therefore, the system is tested, revised, and retested until it meets the desired specifications.
>
> 3. A learning system is based not upon loosely stated 'objectives', but upon a specific and detailed description of what the learner is expected to do after being educated and of the conditions under which he is to perform.
>
> 4. In developing a learning system, the techniques and instructional media most suited to the educational problem are selected. Economic as well as technical considerations are carefully weighed." (5a)

(5a) G.D. Ofiesh, Programed Instruction - A Guide for Management, American Management Association, Inc., New York, 1965, p. 34.

If we look at the systems approach to education as a heuristic development, the concept of educational engineering becomes dramatically obvious. The educational technologist then must develop and work with complete behavioral blueprints that specify exactly what the student is to learn to do at every step through the instructional system. The behavioral blueprint specifies all of the minimum educational requirements, stated in terms of what response the student must be able to perform to a specific stimulus. The blueprint, then, is a table showing all the stimulus-(organism)-response relationships that the educational system must develop. From the objectives a criterion examination is developed. In order to evaluate the effectiveness of the learning system the criterion examination must be a "saturated" one. Every stimulus-response relationship that the objectives call for must be tested. This examination is now generally referred to as a "Master Validating Examination".

Ideal learning systems are adaptive. They allow the learner freedom in selecting the type of material, the depth to which he must study, the sequencing peculiar to the learner, the time devoted to each item, and the time when he wishes to take the final test. The only fixed parts of this technique are the objectives and the criterion testing. Pre and post tests can be prepared for each level of training. These tests are checked for relevance, discrimination, and for equivalence of pre and post items. We now have the capability to analyze each specific element in the system and to evaluate each item with respect to its degree of relevance.

The procedure for administering the programs requires that the trainee or student proceed through each level. At each level he will take the pre test. If the pre test is passed, then he proceeds to the next level pre test. If a pre test is failed, then he takes a training package covering the content of that level. Upon completion of a learning sequence, he then takes a post test which is equivalent to the pre test. If he passes the post test, he then proceeds to the next level of the learning system and repeats the process. We now have a procedure for actually specifying the degree of trainability or educability possible with all levels of students.

C. Research and development.

Regardless of whether one is speaking of education or training, the end process is learning, not education or training. Instead of primary attention to the who, what and how of the instruction given, attention needs to be constantly focused on what learning actually results. The process is achieved through a system which includes all the equipment, procedures, facilities, knowledge, materials, maintenance and personnel required to produce the desired learning. Both "hardware" and "software" elements are included in the process.

Hardware are media instruments. Tape recorders, computers, movie projectors, etc., are hardware. The "messages" the instruments carry, the stimulus configurations, etc., are commonly referred to as software. The ideal message (software) in the ideal instrument or media (hardware) are the two most significant components of the ideal validated learning system.

Media differ in both their display and response capabilities. They vary in the complexity of their capabilities for displaying stimulus materials. Some media, such as a film on TV, have a highly complex capability of displaying both visual and auditory stimuli of great range and variety. Media can be ordered in terms of complexity of these capabilities for displaying relevant subject matter stimuli. The medium which is used to create the learning opportunity, thus, must have both the appropriate display and response capability, so that students or trainees be permitted to practice relevant responses in their presence.

It is impossible to understand social and cultural changes without a knowledge of the working of media. We have already reached a point where remedial control, born out of knowledge of media and their total effects on us, must be exerted. Media, by altering the environment, evoke in us unique ratios of sense perceptions. The extension of any one sense alters the way we think and act - the way we perceive the world.

Still, there is no nationwide effort being made to study, measure or otherwise determine the behavioral technology necessary to produce the validation of motion picture films, filmstrips, still pictures, or television productions, to mention just a few. Some of our films, for example, are often "nice to have films" of relatively high cost which the schools do not really need or particularly want, and when needed and wanted, have not been demonstrated to produce effective learning. This indictment of the current audiovisual situation calls for no less than a commitment to first determining the behavioral specification of our audiovisual materials, and then following through empirically with those strategies of design, sequence, and mediation which are necessary to produce the result required. Maybe there is no market for such materials, but that is another problem. There is a need.

Education and training both involve behavioral change. At the end of the process, the individual ought to be able to do something he could not do before; the individual can perform a skillful action, apply a general rule to a specific situation, describe elements of a complex whole, or perhaps manipulate words or a number of procedures in a unique and meaningful way. Training is the process of arranging the environment of this individual in the classroom or work-site in such a way as to make this behavioral change take place. To operate in both the subsystem and the whole system, education and training personnel use tools such as printed materials, measurements, simulation procedures, A-V media, controls and principles of human behavior. All these comprise the technology for accomplishing behavioral change. Therefore, in speaking of educational technology with respect to both hardware and software systems, we are really encompassing three different technologies: behavioral, communications and instrumentation technology. Again, both behavioral and communications technology comprise the "software" systems while instrumentation technology comprises media or "hardware" systems.

We could say, then, that a learning system is a structured sequence of learning events packaged in a variety of instruments which has been tested and validated on a sample of the target population. Through the tripartite technology of behavior, communications, and (media) instrumentation, education and training will likely be more individually-centered, job-related, and future-oriented. Since job skills may become obsolete quickly, the thrust will be toward specialized training needs of individuals to meet changing requirements of the internal and external environment.

The Department of Defense has probably made more extensive use of educational media than any other institution in our society. And yet, the results of a recent study in the Department of Defense, which the author directed, showed no significant evidence that even within the Department, where the "systems approach" to learning was thought to have taken firm hold, that the media and their content had produced validated learning. Validated learning is learning which has resulted in predetermined proficiency and competency as measured by pre and post test gains. Of 2004 courses involving several categories of media-based innovational efforts by the four military services, there were 392 courses that employed closed-circuit television, 162 used mechanical demonstration devices, and 15 involved some limited exploratory effort in computer-assisted instruction. However, within these three categories of instructional innovation, only 4.3 percent of the closed-circuit television usage was validated -- and these were validated by using the principles of programmed instruction. In the case of the mechanical demonstration devices and computer-assisted instruction, not a single instance of validation was reported. Thus, in combining closed-circuit television, mechanical devices and computer-assisted instruction, it could be said that in only 3 percent of these categories of audiovisual usage was there any evidence of validation.

The point made here is simply that the use of expensive devices or media of any kind should be questioned when neither the content nor the input of the device nor the efficacy of the hardware elements have been validated. We must think in new and more viable terms concerning the most effective use of the new and expensive types of audiovisual media -- otherwise, we will defeat our primary purpose -- that is, increasing their beneficial impact on the learning experience.

A case in point is the concern with which educational media research, design and development has been conducted and the extent and manner in which educational leadership has engineered these developments and profited from them. Unfortunately, media research and development has revealed more of a concern with the logistics, economics and vehicles (i.e., the hardware aspects of media) than with media content and how different patterns of stimulus configurations, sensory inputs and response modes may be related to specific types of learning outcomes. In spite of the glib phrase "multi-media approach", there has been little in the way of a concerted R & D oriented study of using multi-media approaches to produce effective learning.

On the other hand, a spin-off from our concern with teaching machines and other newer media has been our recent critical look into the nature of the learning process. Concern has itensified due to the need to fit newer media into educational efforts. This effort, however, has not been substantive enough to lead to anything approaching a significant attack on the learning problem through media R & D, in spite of claims to the contrary. Here, for example, is a portion of a report which emerged from a national conference held a few years ago on media R & D:

> "The critical problems of education have created great stirrings throughout the country. A technology of education is developing rapidly. Advanced electronic systems engineers who have participated in the conferences have described the exciting possibilities, present and future, of computer-regulated learning.
>
> The media field is witnessing innovation on a hitherto unparalleled scale. Audio- and video-media are being introduced and tested in hundreds of ways. Methods and procedures are being changed. Educational facilities are being studied and redesigned. Teaching machines in many different forms are being made by the hundreds and are being introduced into schools. The use of television is increasing. Thousands of language laboratories have been installed in schools and colleges. Textbook publishers are anxiously assessing the trends of developments of educational technologies...
>
> Truly we are in a period of revolutionary changes in technology as applied to education. We need to know how to manage and use this significant development for the right purpose." (6)

Nothing could be further from reality than the above statement.

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(6) Research Report on Operational Plan for Developing Regional Educational Media Research Centers, by the Division of Academic Research and Services (The Pennsylvania State University, University Park, Pa., April, 1962).

The quality of educational films is rarely as high as it ought to be. On the other hand, there is available at what cost in time, effort and money it is hard to say, a veritable treasure house of film, television programs, and recordings to support nearly every element of the curriculum at almost every level. The problem is not simply to see thatthe service is available at the right time and the right place; the problem is equally one of designing and developing the media-based materials so that they actually do instruct and that teachers are convinced of their value to the student.

In education, we have been content simply to make educated guesses about the things we do and the practices we employ. What we have said about pedagogy so far is equally true about the design, development, use and evaluation of our media. Media design today is an art; it is not a science - and entirely too often a poor art. With media, as with teachers, and with teaching, we have continued to make educated guesses about the things we do, the practices we employ, and how effective they have been. We have been meddling with myths instead of working with knowledge, following folklore instead of being guided by wisdom.

If we would test our hypotheses and find them wanting, then our alternative should be to modify them and try again, and again, ad infinitum. We would base our evaluation and conclusions on empirical results. We rarely test the effectiveness of educational practice by the actual performance of students, and specifically, by the extent to which the student has gained in performance.

It is difficult to find a textbook, film strip, kinescope, A.V. device that was revised because a specific sequence or number of pages or set of pictures, or particular animation sequence failed to actually produce learning. The question is not that many instructional materials are not frequently revised. They are. It is the basis for the revision that is questionable. It is rarely student performance that is the basis for such revision.

The tasks for both education and training are to add knowledge where there is little or none, to develop skills where there are few, if any, and to instill values and attitudes where these are inadequate at best. Performance and behavior are the only valid indexes of the extent to which mediated learning experiences have been successful.

To this end, we must know how effective or ineffective our communication has been. Then we can determine how best to modify and improve the process. The great problem in communication is the illusion that it has been achieved. Modification and improvement must be based on knowing where, when, how, and why we have failed in the communication process. To determine this, we must listen to feedback from the student. Until the loop is closed, we will never really know precisely what kind of learning has taken place - since some kind of learning is always taking place. Empirical,rather than theoretical based R & D is needed..

One fundamental question (on which research has been weak) deals with the nature of the stimulus configurations which must be present in media to produce specific types of learning outcomes. Bugelski has pointed out that "the psychology of learning is marked by great gaps and theoretical controversies". (7) In 1956, Hilegard in his definitive text, Theories of Learning, stated that "there are no laws of learning that can be taught with confidence". (8)

Little has happened to change the picture. Robert Travers,in his studies of research on the audio-visual transmission of information to human receivers, concluded that "there are no widely accepted principles which are used for the planning of instructional films. In producing an instructional movie, decisions are made on the basis of hunches and intuition, rather than empirical research." (9) When we say to the educator designing instructional media that he must intelligently select his media and plan for the content in the media so that the most effective presentation and response modes will be used, we ought to further indicate that little guidance will be forthcoming from the educational psychology laboratory.

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(7) B.R. Bugelski, The Psychology of Learning Applied to Teaching, the Bobbs-Merrill Co., Inc., New York, 1964, Page 14.

(8) Theories of Learning, New York, Appleton-Century-Crofts, Inc., 1956, p. 14.

(9) Robert M. Travers, "Transmission of Information to Human Receivers", Educationa Psychologist, Newsletter of Division 15, American Psychological Assoc., Dec., 1964, Volume 2, No. 1, P. 4.

The research project sponsored by the Educational Media Branch of the U.S. Office of Education, under Robert Travers at the University of Utah, may produce some guidelines in the years to come. (10) Travers and his colleagues are exploring "conditions of transmissions through eye and ear, and examining the usual propositions about the construction of teaching materials". The research that Travers and his colleagues have completed so far has already raised some serious questions regarding some traditionally accepted myths and folklore used for the planning and design of audio-visual materials. They are questioning, for example, the superiority of transmitting the same information simultaneously through the visual and auditory senses rather than using one sense modality. For years it has been "common sense" for many who would design media that two senses are better than one. And there has been little to challenge this particular notion in textbooks, in educational psychology and workbooks in audio-visual and media courses. Another pre-conceived and "common sense" concept that is being critically challenged by the Travers research is that "other things being equal, the more realistic a presentation is the more effective will be the transmission", and, therefore, the more effective learning will result. Travers points out that even though "both of these propositions have a high degree of plausibility, which has given them almost the status of cornerstones in the audio-visual field, they have generally been accepted without the scrutiny they deserve. Our purpose here is to subject them to critical examination." The implications for such research are obvious. Already enough basic research has been done that much applied research drawing both on the type of work that Travers has conducted and research in the field of growth and development and in the area of cognition can contribute to the design of further experiments. Such study, if properly and rigorously carried out, would suggest a number of implications for the design of media as effective teaching materials.

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(10) Ibid.

However, we cannot wait and anticipate that all guidance will come from the research laboratory. Imaginative and creative minds must get on with the task of empirically trying out various things and determining whether they will or will not work. If they do work, then this in turn may be stimulating to the research minded educational psychologist to explore in his laboratory the possible theoretical basis for explaining the phenomena which have been demonstrated.

We may anticipate that a science of education will be empirically-based long before it will be theoretically so based. Many ingenious and creative ideas need to be put to test in the living laboratory, namely our school rooms. We need "wind tunnel" schools for our experiments. Until education and its correlative pedagogy develop a scientifically-based technology rooted primarily in behavioral technology, education will not become a profession - let alone a science. Unless the efforts of educators and media personnel are to be predicated on the qualities of a scientific enterprise and pedagogy and media utilization ceases to be an art - the effort required to produce the quantum jump forward in educational process - so desperately needed - is not likely to occur. A breakthrough will only be possible in those areas where research and development efforts can be rigorously applied. The behaviorist provides the process of education - not the goal.

Another dimension that is provided by the Skinner experimental analysis school and other behaviorists is to subject the pedagogical competencies of the teacher, the stimuli configurations, the sequencing of subject-matter content, and numerous other software (message design) considerations, to tested empirical validation.

The only criterion that is acceptable is observable change in the performance of behavior of students. The behavior of students, if you do not like the word "performance", is the way they function, the manner in which they function, how they act, how they feel, what problems they solve, what types of contingencies they resolve, what discriminations they make, what approach or avoidance behaviors they evidence, etc.

Either learning theory, educational psychology and educational research have been almost completely unproductive in their contributions to educational technology, or there has been an unwillingness to test the laboratory-generated ideas in our "wind tunnel" schools. A critical survey of the American educational spectrum will not reveal any pervasive movement of comprehensive educational practice, which can be traced to the deliberations of learning theorists and/or educational psychologists. Little in American educational practice can be traced to extrapolations from the laboratories of educators or behavioral scientists or educational psychologists. And the exceptions that come to your mind to disprove this generalization are only the exceptions that prove the rule.

To complicate matters and make them more difficult we may note that there is little in educational theory to guide us. The psychology of learning, as pointed out by Arthur Melton, is marked by great gaps and theoretical controversies.(11) There is a lack of scientific information about learning that results in a serious division of opinion on just how ready psychologists are to offer help to the educational practitioner - namely, the school administrator and teacher. Arthur Melton goes on to point out that while there have been impressive advances in the study of human behavior, "and especially of our understanding of learning process in the last twenty years, the fact remains that there is no unified science of learning". And this makes application difficult.

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(11) A.W. Melton, The Science of Learning and the Technology of Educational Methods, Harvard Educational Review, 29, 96-106.

William Estes, in his "Review of Learning" for the Educational Encyclopedia, offered very little in the way of real comfort for educators when he said, "There is no convergence imminent between the educators' and the laboratory scientists' approach to learning". (12)

D. Utilization of educational technology.

Probably no other approach to learning has been as systematically and rigorously studied in actual field applications as has the exploratory efforts made by business, industry and education to educational technology based on the process of programmed instruction. But, as has been stated before in this paper, traditionally, education and training have been categorized within the realm of the arts; they have not been classified as sciences. Yet, in an age of atomic energy and aerospace, of electronics and technology, we have been content to grapple with the correlative problems of education and training using "horse and buggy" education and training systems - or non-system. The effort to apply what we know about learning to the art of teaching has been a colossal failure in terms of what should have been done and what merits immediate action.

Attempting to meet the challenge of the technological revolution in our society have been the four major educational and training institutions: the government, the military, the public and private sector, and American industry. Industry, probably more than the others, is beginning to recognize that a technological revolution in education and training to parallel the new "industrial revolution" is necessary if our society is to avoid retrogression - and, indeed, if it is to survive. Industry is increasingly aware that the forces at work in the economy today are reshaping our manpower requirements. The National Association of Public School Adult Educators recently pointed out that "our educational climate must be attuned to these new requirements (millions of under-educated adults and unemployable citizens) and provide the kind of training that will give workers skills to match modern-day jobs." Automation and mechanization can be a blessing for our society, but it exacts a high social price. "It eliminates thousands of lower level jobs and requires better education and training for the new jobs it creates."

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(12) William Estes, "Learning", Chester W. Harris, ed., Encyclopedia of Educational Research, MacMillan Co., New York, 1960.

Geary A. Rummler, Director of the University of Michigan Center for Programmed Learning for Business, has said, "The industrial educational system (is) in the forefront in producing educational innovations, (and) continued technological change in industry makes this the most aggressive and progressive educational system we have". (13)

It is likely that in another ten or twenty years educational and training innovations will have become massive and will be coming fast and automated instructional systems will have become as common as TV sets and automobiles, providing ideal instruction for every student on an individual basis. If this occurs, its origins will be directly traceable to the innovative murmurs that are occurring in various facets of government and industry. In fact, the contribution of both the military and industrial establishment provided to the educational community could well rival those of the industrial and technological revolutions.

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(13) Gabriel D. Ofiesh, op. cit., p. 4.

The thousands of studies leave no doubt about one thing: educational technology in the form of programmed instruction, for example, teaches. Students do learn from it. In general it teaches much faster and more effectively than conventional methods do. Wilbur Schramm, in his review of the research on programmed instruction, states unequivocally that students learn from programs:

> "They learn from linear programs, from branching programs built on the Skinnerian model, from scrambled books of the Crowder type, from Pressey review tests with immediate knowledge of results, from programs on machines or programs in texts. Many kinds of students learn -- college, high school, secondary, primary, pre-school, adult, professional, skilled labor, clerical employees, military, deaf, retarded, imprisoned -- every kind of student that programs have been tried on. Using programs, these students are able to learn mathematics and science at different levels, foreign languages, English language correctness, the details of the U. S. Constitution, spelling, electronics, computer science, psychology, statistics, business skills, reading skills, instrument flying rules, and many other subjects. The limits of the topics which can be studied efficiently by means of programs are not yet known." (14)

Albert Hickey and William Laidlaw reported on a study involving 130 U.S. Navy Supply officers using the adjunct type of program. The program was designed to train the officers in retail sales and ship's store management.

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(14) Wilbur Schramm, The Research on Programed Instruction, U.S. Department of Health, Education and Welfare, Office of Education, OE-34034, Bulletin No. 35, 1964.

The conventional instructor's lecture hours were reduced by 17 percent, and the students' reactions were favorable. (15)

David S. Bushnell studied the effect of teaching machines in a voluntary education program for adults. The program, using a branching type of teaching machine, was electricity for journeymen. The three approaches that were studied were (1) self-instruction, (2) self-instruction plus live discussion, and (3) conventional instruction. Student attitudes and results favored the self-instruction plus live discussion. There was higher subsequent enrollment with this method than with the others. (16)

Albert E. Hickey and Jean Anywll studied the effectiveness of using programmed instruction in the training of 120 package billing clerks for Spiegel, Inc. The 2,000-frame program resulted in a 34 percent reduction in the average time needed to attain proficiency as it was measured by the criterion examination. (17)

To date, research on the applications of programmed instructional-based educational technology in industry and in education has consistently demonstrated that it increases learning proficiency or reduces training time and it usually does both. On the other hand, research concerning the various techniques of programming such as linear, branching, adjunctive, and others has not conclusively demonstrated the superiority of one over the other. Numerous studies of overt (out-in-the-open) versus covert (internal or thinking) responses also have not been conclusive. So many factors are operating and so little is yet known about the various elements of programming technology that one cannot expect more than the general finding at this time that programmed instructional-based educational technology does work for at least a majority (probably 80 to 90 percent) of industry's training problems. The implications for education should be obvious.

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(15) Albert E. Hickey and William J. Laidlaw, *Programmed Instruction in Retail Sales*, Final Report to U.S. Navy Bureau of Supplies and Accounts, ONR Contract Nonr-3630(00), Entelec Incorporated, Newburyport, Mass., 1962.

(16) David S. Bushnell, *Technological Change and the Journeyman Electrician: An Experimental Study in Continuing Education*, Stanford Research Inst., Menlo Park, California, 1963.

(17) Albert E. Hickey and Jean B. Anywll, *Programed Instruction of Package Billin Clerks*, Information Technology Labs (Itek), Lexington, Mass., 1961.

In October, 1960, Eastman Kodak, International Business Machines, and the Foundation for Research on Human Behavior at Ann Arbor, Michigan, hosted a conference called "Programmed Learning: Evolving Principles and Industrial Applications". The conference was held to "examine the 'state of the art' in research on programmed learning and the outlook for its applications in industry". (18) Speakers and discussion leaders included such prominent pioneers as B.F. Skinner, Arthur A. Lumsdaine, Robert Glaser, and John Hughes. Approximately 30 industries, including the large companies, Proctor and Gamble, The Detroit Edison Company, Union Carbide Corporation, Aluminum Company of America, Ford Motor Company, Radio Corporation of America and Corning Glass Works, sent representatives. Both Eastman Kodak and IBM had pioneered a limited effort in the applications of programmed instructional-based educational technology to their training needs. Their efforts were reported to the conferees along with discussions of the principles of programmed learning, learning theory and future research, and known programs and programmers.

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(18) Jerome P. Lysaught (Editor), Programmed Learning: Evolving Principles and Industrial Applications, Foundation for Research on Human Behavior, Ann Arbor, Michigan, 1961, pp. 155-159.

It is significant to note that at the time the report on the conference was published (1961), the list of known programs and programmers numbered no more than 50.(19) The day before the conference started (October 16, 1960), saw the publication of the first definitive text, Teaching Machines and Programmed Learning, edited by two of the conferees, Arthur A. Lumsdaine and Robert Glaser.(20) This book includes 47 basic papers and a 28-page bibliography plus a research abstract. Although there had been numerous provocative, over-enthusiastic, and diatribe-like articles published in newspapers and periodicals, the only other major publication of any merit which had been published prior to the Ann Arbor conference was Eugene Galanter's, Automatic Teaching: The State of the Art.(21)

Four and one-half years later the applications of programmed learning to industrial training problems have certainly accelerated. During the 1960 conference Robert Glaser was asked, "Why hasn't industry used this programmed instruction long before now?" He replied:

> "It's interesting to point out in this regard that teaching machines have developed out of the psychology of learning. In a recent survey, I found out that in industry - and this is probably true in the colleges of education - most psychologists are employed to

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(19) Ibid.

(20) Arthur A. Lumsdaine and Robert Glaser (editors), Teaching Machines and Programmed Learning: A Source Book, National Education Association, Department of Audio-Visual Instruction, Washington, D.C., 1960.

(21) Eugene Galanter (editor), Automatic Teaching: The State of the Art, John Wiley & Sons, Inc., New York, 1959.

> do other things than training. Training in industry is not carried out by people who have any experience in experimental psychology of learning. Just now people who have had some work in experimental psychology are beginning to work at training in industry. But in the booklet that came out, 'What's Being Done in Industry?', I noticed that there was selection, morale building, and things of this kind - training was omitted." (22)

Whereas the Ann Arbor conference in 1960 relied on the one-and two-year experiences of IBM and Eastman Kodak, the applications today in American industry number in the hundreds, and literally thousands of people have been trained by programmed instructional-based educational technology.

In 1964, the National Foremen's Institute surveyed 350 large companies. Of 200 companies, 20 percent reported actual experience with programmed instructional-based educational technology, a sizable increase in such a few years. The rest of the companies surveyed were exploring the subject and expected to use the technology eventually. It is also significant that the American Society of Training Directors found similar percentages in a survey which it conducted. Its study "showed that only 20 percent of the respondents were currently using PI,but the overwhelming majority - 98 percent - expressed keen interest in the field".

Applications have been as varied as they have been numerous. Frank Fuchs and Leonard Silvern, using an aural-visual teaching machine (Hughes Video-sonic), have taught fire-fighting recruits a 252-step lesson in

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(22) Jerome P. Lysaught, op. cit., p. 75.

"Fire Behavior". The course was given to 34 recruit firemen of the Los Angeles County Fire Department with positive results.

One of the most significant demonstrations of the application of educational technology to present-day problems of the disadvantaged are the Responsive Environment Projects. These projects are funded by the Community Action Program of the Office of Economic Opportunity. The projects are located in three different geographic areas: Greeley, Colorado; Chicago, Illinois; and New York City and are administered by three differing organizations.

The Greeley Project is called the New Nursery School. It is a nursery school housed in an old home. The entire nursery curriculum is based on the responsive environment approach, including non-automated responsive environment booths. The project is administered by Colorado State College, but is located in the section of town where there is a large group of Spanish-Americans. These are the children who come to the New Nursery School to develop a more positive self-image, develop more senses and perceptions, learn how to solve problems and develop concept formation abilities, and increase in verbal skills. All areas of the curriculum are designed to contribute toward the accomplishment of these four objectives, but the responsive environment booth is the best known feature of the school. Here the child works his way through the phases, solving problems in his own way, discovering the rules of the game as he explores the typewriter keyboard and it responds to him. He learns to locate each key, both upper case and lower case, to call them by name, and to put them together into words, then sentences, and finally to write his own stories. These non-automated units present the same type of stimuli as the computerized talking typewriter. The child has the same problems to solve as with the automated machine and his is reinforced when he discovers a solution. The only difference is that his reinforcement is given by a booth attendant rather than by the machine itself.

Project Breakthrough in Chicago is administered by the Cook County Department of Public Aid with intensified social casework as an important part of the project. The OEO wanted to test the feasibility of utilizing educational technology in a large public service agency. They were interested in the impact of casework coupled with the innovative educational approach on the welfare family. Pre-schoolers were bussed from their housing project areas to the nursery classroom for 1½ hours daily. There they participated in the enriched environment of a well-organized and well-run nursery. Each day the child was invited to come to the lab area and work with a talking typewriter. He had a choice of refusing his turn for the day. He may go into the booth and work with a talking typewriter. He had a choice of working with an automated unit. He also had the choice of refusing his turn for the day. He may go into the booth and work with the computerized typewriter alone or he may prefer to have an attendant sit in the booth with him. The staff in Chicago devised many games and interesting activities to help the very young and immature children feel successful as a part of the group as well as an important individual.

The Responsive Environment Program Center in Brooklyn is the largest demonstration of educational technology in the country. This laboratory has 20 ERE machines, twice as many as the Chicago Project. Under the administration of the New York City Board of Education, this laboratory is a neighborhood center where all people of all ages may come to improve their reading skills. Preschoolers come with the Head Start classes, elementary students, teenagers, and high school students are bussed from their regular classrooms daily to work in this "special" lab. Teenage dropouts and adults, as well as others from the neighborhood, come to study in the evenings. The coordinated classrooms are well equipped to supplement the talking typewriter learning for all age levels.

Enthusiasm of staff and students is high in each project and the surrounding counties have shown great interest. Results to date have shown positive trends. The contracts have been renewed for an extra year. Guidelines are being documented by each Center for replicating a responsive environment approach in a similar setting.

E. Gap between the research and application.

In spite of the foregoing results, trends and successful "murmurs", much has still to be done. Education has always needed a long lead-time to adjust to changes required by society and the times. Industry and business have been the customary leaders in rapid application of scientific and technological innovations to their requirements. If their lead-time was as long as that of education, it is probable that the U.S. would not have a man on the moon before the 21st century. Yet, the slow process of bringing changes to education should become intolerable in view of our national commitments.

No less than a revolution in education and training is necessary. Witnessing a technological, scientific, knowledge and population explosion, we need - urgently - to witness a correlative educational explosion.

Top educational management must be convinced of its role in the solving of educational and training problems in our society, the role of mobilizing and providing the leadership and the climate for innovation. Models and demonstrations are needed, cost analysis and effectiveness studies are required and a national institute or agency appears necessary to provide data, rationale and supervision from which orderly development may proceed.

The problem of a time lag between educational and technological research and the application of its findings is inevitable. Research takes place on an abstract level with verbal and mathematical hypotheses, whereas its implementation takes place on a concrete level with real problems of cost of operation, recruitment and training of manpower, availability of supplies, and so forth. However, the increasing gap between research in educational technology and the implementation of its findings by educators is cause for national alarm and should become one of the critical issues confronting a potential National Educational Policy Research Center.

The following statistics should be cause for alarm, not because matters are getting worse but because they are not getting better rapidly enough.

> "The national number of dropouts in grades 1 through 12 is about 30 percent.
>
> As of 1965, on a national average, only half of the 70 percent who do complete grade 12 take with them over 9 years of cumulative content.
>
> On a national basis, only 50 percent of our high school graduates start college, and only 50 percent of this second group will graduate from college." (23)

The dropout rate is probably still better than it was 10 or 20 years ago. In addition, we are probably producing more high school and college graduates than any other country in the world, and certainly doing it at a higher rate than we have ever done it in our past history. There is no question, however, that technological developments in our society are emerging at an exponential rate and that our educational system must increase its output in order to meet the demands generated by the industrial technological complement.

A group of school administrators told Richard Wynn in 1966:

> "(1) We have the paradox of a nation that miraculously assimilated in the last century millions of immigrants of many races, nationalities, religions, and political backgrounds and built a great national unity; yet, the same nation finds its educational system a century later in near chaos in many communities because of its inability to assimilate native American students of a minority race.
>
> (2) We have the paradox of a slum child in desperate search for an acceptable self-image, attending an educational system addressed increasingly to the structure of knowledge rather than to the structure of self.

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(23) Donald K. Stewart, A Learning Systems Concept as Applied to Courses in Education and Training, p. 4, (unpublished paper).

> (3) We have the paradox of a teaching profession which prefers not to serve those clients who need its services most. Whereas physicians work with the sick rather than the well, the teacher prefers not to teach those whose academic problems are most severe, and most administrators prefer not to lead those systems which are most sick.
>
> (4) We have the paradox of an educational system attempting to serve an increasingly urban and industrialized society, yet, operating on an obsolete rural and agrarian model." (24)

One of the author's doctoral students, a teacher in a school located in the wealthiest county in the United States, described the following conditions in her school as they existed as of June, 1967:

> "(1) Minority races do not attend our school because of the white suburban housing ghetto. A 1967 suggestion that students be bussed across county lines to provide for integration of racial groups was rejected by the local board of education.
>
> (2) Rich children, as well as slum children, are in desperate search for an acceptable self-image. Our bright students have learned how to get A's and B's for their college entrances. But many of them crack up in college, once they discover that they don't want their 'school-self' to be their 'real-self'. For students whose grades label them as 'non-college material', there is no separate curriculum. They are required to take the same basic subjects (English, math, science and social studies) as the verbally adept, and are moved along, lock-step, until they are graduated. They, and society, believe that their 'D' average stands for 'dumb'.
>
> (3) Our school has no special education classes nor is there any staff provision for effectively helping the acting-out non-learners; they are sent to the traditional seat in the principal's outer office where a secretary orders them to shut-up, or to the guidance office where a counselor administers and urges them to try to stay in the classroom. (This is not an indictment of the administrators or counselors, they are so overburdened by clerical record-keeping duties that they have very little time or energy to work at the symptoms, let alone the causes, of a student's discontent.)

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(24) Richard Wynn, "A Lesson in Paradox", Educational Administration Quarterly II, Spring, 1966, pp. 74-76.

> (4) Our principal is responsible for administering a staff of 75 faculty and supporting services personnel, and 1200 students, as well as being responsible for the physical plant and supplies. He has no business manager or executive director; no finance or personnel officer. The school's financial records are kept by his secretary who also types up his personal correspondence ... Attendance is recorded by hand by teachers whose records are, in turn, recorded by hand by another secretary. Library and textbook records are maintained by a staff of three... Teachers, after the close of each school year, spend two days entering grades on record cards for every student. As for audio-visual aids, every room has an overhead projector but most of them collect dust as there has been no required training program for teacher use. The school owns filmstrip projectors and filmstrips, but the weather - not the learning program - dictates when they will be used as most of the rooms do not have blackout curtains...."(25)

For a grim picture of the gap between technology and tradition, the following excerpts from a North Carolina teacher's correspondence (February, 1967) are offered as evidence that there is due cause for concern:

> "...The only ditto machine in the school is in the ladies' room; we women teachers run off stencils for the gents before or after school (I have no free period and during the 30 minutes for lunch, I take a class to the cafeteria). Our faculty meetings are short but grim; if the school had a tape recorder, I'd make a tape of a meeting to send to you. Each teacher is allotted $23 for school supplies for the year - stencils, chalk, erasers ... anything above this you pay for. The school desks are so carved on that writing on them is impossible without a pad ... poor lighting, worn-out shades that light comes through, although,since audio-visual aids are practically non-existent, it doesn't make much difference. There is one movie projector in the school, but the films in the county are outdated, I'm told - I still have yet to get information on how to get a film anyway, despite my inquiries. The library is inadequate - located above the main office; shaky tables, metal folding chairs that make lots of noise...
>
> ...a word about the type of students in my eighth grade: age range is from 13-16; few can read above third or fourth grade. Cleanliness is unheard of (breath will turn you sick)...

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(25) The school described here is Kensington Junior High School, Montgomery County, Maryland.

> disease infested... scanty or revealing clothes...constantly talk, saying exactly what they please...they need special education, trade schools, etc., but the state and county do not provide funds for such....
>
> With such primary evidence, one can wholeheartedly agree with the findings of NEA's 'Year of the Non-Conference, 1966-67' Report that, 'The job of the teacher has become unmanageable...' The self-contained teacher and the self-contained classroom have to go. No single individual has the competence, energy and time to deal effectively with all the responsibilities assigned to one teacher." (26)

A contributing factor to the unhappy state of education today is the reluctance of educators to become members of inter-disciplinary teams. Just as a single person must experience independence before he voluntarily will give up some of his freedom for the benefits derived from interdependence, so a professional group must feel secure before it is willing to share some of its identity. The medical world is managing this; most doctors now concede that a hospital can run just as well and probably better with an administrator trained for management rather than for medicine. And they work with psychologists, biologists and physiologists for research projects. But educators seem to cling to each other. Is there a public elementary or secondary school in the United States which has hired a business administrator to run its school? Or a psychiatrist to head its guidance-counseling staff? Or an educational technologist to direct its learning program? The problem of unwillingness to communicate with scientific disciplines is one of long standing. Robert Travers reports:

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(26) From correspondence to Catherine Tift, February, 1967.

> "Joseph Mayer Rice was the first to discover that the results of research do not bring about educational change, however persuasive the results may be. The educational subculture is basically resistant to the efforts of an agent such as a research worker to produce change...Rice was a physician by profession but he became interested in problems of education and made a two-year visit to Europe in the 1890's where he studied pedagogy and psychology. His book which followed, The Public School System of the United States (1893), in which he summarized the observations he had made on 1200 teachers located in various schools from Boston to Philadelphia in the East to St. Louis and Minneapolis in the Middle West. Educators paid no attention to the opinions of a layman; legend relates that he was met with jeers when he attempted to present his findings to a meeting of the National Education Association...Rice's effort to produce educational reform had absolutely no effect on his contemporaries." (27)

We should not oversimplify the causes for today's educational problems by just pointing a finger at educators. Ralph W. Tyler suggests that our schools are in trouble partly because of our changing socio-economic conditions. He points out that:

> "Teachers today are drawn from a population in which 2 million children were born each year, to educate children coming from a population in which 4 million are born each year. This means a continued pressure on a limited number of adults to provide for a very large number of children.
>
> The public is assigning its schools new educational functions today which were not recognized in earlier years....
>
> There is continuing public resistance to higher support levels for buildings and teachers. The need for much larger funds to care for the 4 million children each year presses the public at the same time its population increase is requiring funds for other public services such as public health, roads, and police protection."

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(27) Robert Travers, Training Research and Education, ed., Robert Glaser, New York, Wiley and Sons, 1965, p. 526.

> "The public's perception of the nature and significance of the educational job is inadequate...The public thinks of education as being something like a quiz program...As more and more young people go on through high school to college, where the complexity of learning is much greater, the public is even less likely to appreciate the greater difficulties in teaching." (28)

When we consider these cold facts, along with all the reasons listed above for the gap between educational technology and the classroom, the educational technologist is faced with a two-fold problem. Software people need the opportunity to provide convincing and sophisticated programs and the hardware people will have to turn to their own technology to reduce cost and increase efficiency. This is a critical area that needs scrutiny by those concerned with educational policy research.

In every recent year, information growth on new developments in educational technology and a rapidly growing bibliography for the field reflect the increasing interest in this area. It is important to recognize, however, that "interest" is not synonymous with "implementation". Educational technology is here, tools are available, and trial learning laboratories are emerging. The task remaining is (1) the coordination of these efforts, (2) the validation of these efforts and (3) the large scale adoption of the programs which prove valid. We can no longer afford to continue our piecemeal approach. Our traditional insistence that education is a local problem must give way to our increasing awareness that what we have on our hands is a staggering national problem which needs national support.

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(28) Ralph W. Tyler, "Social Trends and Problems for Tomorrow's Schools", in New Teaching Aids for the American Classroom, U.S. Department of Health, Education and Welfare, Office of Education, Washington, D.C.

F. New developments in the next twenty years in educational technology.

(1) Computer assisted learning:

Probably the most significant development in educational technology is that of computer-assisted learning. The basic reason for CAL is to present material by deriving display devices so that students can understand concepts by performing problem-solving calculations and by simulating complex, real-life situations. It is with the computer that we can assist the student with this sort of learning process.

Present instruction which utilizes lock-step approaches is not only inefficient but also confining in that it ties down the teacher. Through computer-assisted learning (CAL), we can free the teacher and allow her to spend more time in small group discussions and individual conferences. By so doing, the teacher may be able to determine what approach will most effectively solve a given student's learning problem, and she may then select appropriate CAL programs designed to overcome the difficulty, or she may prescribe other alternatives. Yet, if through CAL, modules are properly programmed to meet specific behavioral objectives, and if through CAL only those course units are programmed which require adaptive, individual instruction, CAL will not be useless but will become irreplaceable in the learning process.

Before utilization of CAL can become far-reaching, new courses in almost every discipline will have to be developed. During the development period, care must be taken that courses are not duplicated. Since any CAL course can be evaluated only by the end result, i.e., the changed or improved student behavior, extensive evaluations of the programs will have to be made in terms of criterion test results and exhibits of terminal behavior. That process of evaluating software will be facilitated by a computer's capability of immediately recording a student's answers, response time, etc., and then by its capability of tabulating the results for an evaluator.

The computer is no panacea, it is no more than a highly sophisticated "tool", a tool of such boundless possibilities that no one can yet project the full extent of what it might help them accomplish for education, even in pupil personnel and guidance services. The computer will not replace a teacher, a guidance counselor, or an administrator; the instrument will extend the capabilities of these educators. An important first insight about the computer is that the instrument derives its capabilities from men themselves. Nothing yet invented, including the most versatile and sophisticated computer, can replace the need for human decision and action. The computer can manipulate the mini-hardware technology that is emerging,such as the CBS-EVR system where a plastic cartridge that is expected to retail for $15.00 can present an hour-long sound film through a modified home TV viewer which can also stop the film at any frame for prolonged viewing. This will bring the art of the LP record and the cassette tape to the sound-film business. Audio-visual technology will provide inexpensive materials to many.

Through the computer those materials can then be provided which are most suitable to individual requirements.

(2) Edunet:

Edunet is a proposed nationwide (and perhaps worldwide) educational network which would tie together computerized TV and other electronically generated information from various participating university, institutional and governmental activities. Its purpose would be to make available to participants on an instantaneous or "on-line" basis information on all aspects of administration, teaching and research. Participants would leave a terminal in a network and, in turn, provide to the total "information pool" that information they had available which was stored by electronic means.

Pertinent background on Edunet is found in a report on a conference held in Boulder, Colorado during the summer of 1966 by the Inter-university Communication Council (called EDUCOM).

> "...The Inter-university Communications Council, for which the short name is EDUCOM, comprised at the time of the Boulder Study, 42 institutional members in 23 states. Its purpose is to bring about collaboration among institutions of higher learning in their efforts to utilize the communications sciences. While all information-processing activities are of concern to the organization, the primary goals are to disseminate reports on the state of information handling techniques and to set up task forces to study areas of critical development. Basic research on the relative advantages of different modes of human communication will be encouraged and eventually the Council may cooperate with secondary and elementary schools in improving instruction.

> Early EDUCOM activities. In January, 1966, the first issue of EDUCOM appeared. This non-technical bulletin reports to faculty members of participant institutions on research, development, and academic applications in the information sciences. Among other topics, articles have been published on time-sharing computers, learning technology, and the use of computers in medical diagnosis. Articles in future issues will cover such subjects as computer-assisted instruction, educational television, and the utilization of computers in the humanities." (29)

Much material deals with the views of various participants on how an Edunet might work. Some authors are concerned with medical diagnostics and associated educative functions. Others talk about mass-dissemination equipment (TV, etc.). The technical people discuss the various "long-lines" or microwave methods of transmission available. Some are concerned about net control (The Edunet system) versus user control (the university, etc.). There are discussions on administration of the net and charges to the user. Some technical people speculate on whether EDUCOM should endeavor to own its own net or lease it from public utilities. And there are many discussions on the various kinds of information that could be sent through the network. In all, the volume reveals well the magnitude and scope of the problem - and the need for policy research addressing itself to these areas.

Edunet is sure to come. It may take directions different from present conceptions, but a network (perhaps part of a larger all-purpose public network), will be established for the transmission of educational information. The problems, both technical and academic, are tremendous. The long distance technology exists - but in many forms. It must somehow be standardized and at the same time satisfy commercial interest of tremendous magnitude. Aside from the "common carrier", a common language must also be devised for the net. This will result in not one, but several languages, alphnumeric, CCTV, video slow-scan, audio time-shared, common buffering techniques, code controlling, line loading, access tuning, etc.

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(29) Comments from a report by the Inter-university Communication Council, Boulder, Colorado, 1966.

All this means time. Certainly, as in other areas of educational technology, the hardware with all its problems is ahead of the software. There are tremendous problems in standardizing the format of information for use by the net. And after standardization we face the problem of converting vast amounts of existing information concurrently with generating new information in the format. Thus, it will be many years before a widespread net is available to "tie-into". But, one cannot forsee any unsolvable problems.

Edunet promises to be a great boon to researchers, librarians, diagnosticians, scholars, mathematicians, engineers, administrators, and anyone else who can benefit greatly from immediate access to data from nationwide sources. It will benefit the actual process of instruction in certain selected areas. Principally, where a linear learning sequence of events can be transmitted for use by a large audience or for local recording to be used as required. It will not be until many years after a full net has been established that use of the net will become effective and efficient for the individual student learning from on-line adaptive programs.

(3) Organic curriculum:

What is likely to become the most significant demonstration of software oriented educational technology is the major research and development effort referred to as the organic curriculum or ES-70 sponsored by the Division of Comprehensive and Vocational Education Research. (30) The effort has considerable promise of adapting high schools to the needs of disadvantaged and advantaged students alike. This effort to re-design the current comprehensive high school curriculum seeks to integrate academic work with occupational training.

Eighteen different school systems representing a cross-section of inner city, rural and suburban areas have volunteered to serve as sites where the new curriculum can be developed, tested and evaluated, in an actual environment.

In order to build this type of student-centered curriculum, a study is being conducted of the behavioral attainments needed by the individual for entry into a variety of post-high school activities. Whenever possible, these requirements will be stated specifically and in measurable terms. The ingredients of such a program will include academic as well as occupational training in addition to such components as personal development, real work experience, and personal and vocational counseling. Even the avocational or school-sponsored recreation or social programs may be considered an integral component of the system. Each of these components and sub-parts must be defined in terms of its contribution to the attainment of the specified behavioral objectives.

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(30) These comments based on a report made by David S. Bushnell, Director of Division of Comprehensive and Vocational Education Research to the Educational Media Advisory Group on October 10, 1967.

The Division has begun to issue requests for proposals for the development of behavioral objectives. In the first phase these objectives would originate on the basis of academic disciplines, and in the second phase, the resulting objectives would be analyzed, evaluated and resynthesized in terms of coherent and logical groupings independent of the discipline in which they originated.

The significance of this program should be substantial in terms of its long range, systematic attack on many of the factors which alienate youngsters attending urban schools.

(4) Professional training of educational engineers:

A program is in the process of development to assure that the use of educational technology would be widespread and would involve various groups of individuals and institutions which would provide professional training in educational engineering through the extensive use of educational technology. This program would be designed to meet with as many people as possible at various levels in a variety of governmental institutions, so that they can become trained in the use of all aspects of new education.

The program would initially focus on the training of Federal educational and training specialists. This includes educators who work for technical training organizations of the Federal government. The work of this group covers all aspects of educational technology - curriculum development, course design and structure, teaching materials development and publication, evaluation, test and measurement systems, teaching methods, training aids, special devices, and even programed instructional-based educational technology. Because most of the technical training schools are located on military bases, they are remote from centers of learning and higher education.

A second group would be those individuals who work on small college faculties, and, specifically, members of the new junior or community colleges. These individuals generally have a great desire to further their own education and, in turn, increase the scope of the instruction they offer their students. All too often they are limited by the same time and distance factors that hinder the educational specialist working for the Federal government, and they must meet the two current prime criteria for advancement - advanced degrees and professional publications.

A third group would be classroom teachers throughout the nation. It is true that much of this group lives in cities or near centers of education and can avail themselves of advanced course work, but many more live and teach in areas romote from an institution of higher education.

One area in which the most profound change should be noticed is the field of educational research. When, for example, graduate study is offered through this program to the literally thousands who have thus far been denied, the door will be opened to previously untapped populations and to problems which can be subjected to sound research study. For instance, most individuals who work in the military training institution work with students that are representative of a great cross-section of the nation's population. At the same time, the specifics of the student population can be controlled or are better known than in almost any other learning/teaching/research situation. Often the actual content and structure of the various courses can be controlled for purposes of research. Probably more important, when the results of sound research indicate the need for change, that change can be quickly instituted.

Today, there are many small and unrelated research studies being undertaken in many military training schools, and whether these studies are being guided in such a way that the results will really be meaningful, or that the techniques of research being used are valid and appropriate, is a moot question. There is no doubt concerning the intent and dedication of these researchers. If they can enroll in this program, however, their efforts would be better guided, the results more sound, and the application more meaningful. With exceptional skill in writing and preparation, the program will, in all probability, be able to overcome many of the cases of physical/mental lethargy that not only block change, but prevent effective use of present methods.

(5) Early learning:

Probably the most productive area for the full application of educational technology which is being considered today is that of early learning. Pre-natal and peri-natal care of the fetus, e.g., pre-natal administration of oxygen plus low-cost audio-visual teaching machines for the 18-month to 4-year olds will produce world-wide early cognitive development. Oaklead-like curricula (self-instructional, self-pacing) applied to nursery schools for the low-cost teaching machine graduates, will quickly advance beginning readers to the second or third grade reading level. The Library of Congress reduced to a box of microdot cards, discs and CBS-EVR like cartridges to play home movies through television, greatly increased information facilities, etc., will allow the six-year olds of the future (some of whom may now read at the seventh grade level) to perform research in the home. Pocket and-or desk-top video-phones will connect (via laser satellite) the young researchers with one another and with senior researchers around the world. Logic and set-breaking type games will be widely used by the youth to increase their creative and productive thinking abilities.

(6) The dream of cybernetic systems in teaching and training:

It is realistic to speak of eventual development in the next two to three decades of completely adaptive cybernetic learning systems. We can talk about a cybernetic learning system which will perform its task with a precision and a rapidity now unmatched in human beings. We would be doing things which are distinctly unhuman or non-human by machines, thus freeing instructors truly to humanize man.

Cybernetic teaching machines will perform in a manner which is impractical or impossible for human instructors to duplicate. They can be designed so that they will not make the errors of human instructors. They will detect and correct errors in their own performance. They will indicate to their designers which of their components are producing the errors so that they can be removed and replaced. They will be able to make judgments of an instructional nature. They will be able to tabulate appropriate data and search their memories for significant information which either has been programed into them along with their instructions or has been acquired in the process of manipulating new data. They can be designed so that they can learn from past experience with their environment.

Ulric Neisser points out that machines can be designed to:

> .."behave intelligently and purposively. Such a direct use of these terms may be surprising. Is not a machine something made out of simple and unintelligent pieces? Indeed it is, but here as elsewhere, the whole is more than the sum of its parts. Out of many thousands of simple operations by relays or transistors can come something unpredictable and adaptive: perhaps a new proof for a logical theorem, or persistent search for an elusive target." (31)

Computers have been programed to write TV dramas, although admittedly not of a very high level, to develop musical scripts, to translate from one language to another, and to simulate other logical brain processes, such as playing chess and solving puzzles.

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(31) Ulric Neisser, "Computers as Tools and as Metaphors", an address delivered at Georgetown University Conference on Cybernetics & Society, November 20, 1964.

A computer-like instructional machine could handle intellectual problems on a great level of sophistication in philosophy, logic,politics, social issues, the social sciences such as economics, behavioral sciences, and the physical sciences.

A computer-augmented cybernetic learning system could analyze the student's inputs and responses to a particular set of problems and thereby determine the "critical path" that will lead the student to the next proper item or step in the learning sequence. With the assistance of such cybernetic devices we may even be able to determine the ideal learning sequence for a specific student on the basis of a series or pattern of his responses which will guide the system, the machine continuously correcting itself accordingly.

For, if computers can issue instructions for playing war games, why not apply them also to developing procedures for coping with political and psychosocial issues in the classroom. Where there is a definite concentration of classrooms, and a concentration of students within them, cybernetically-oriented devices have their greatest potential in effectively and most economically achieving measurable results. Such instrumentation could be directed toward social problems involving attitudes, motivation, and difficulties related to deprived children - especially in the large urban centers where such problems are most critical.

PART II

EDUCATIONAL POLICY RESEARCH ISSUES AND THE ECONOMICS OF EDUCATIONAL TECHNOLOGY

With the increasing concern with educational technology, the issues related to the problem of cost effectiveness arise. Unfortunately, an emphasis has been placed on cost effectiveness without a supporting foundation. The original concern should have been with cost analysis prior to new, extensive deliberations about cost effectiveness.

Specifically, well defined criteria of cost effectiveness in the selection, use and tangible benefits of audio-visual media are virtually nonexistent in all training and educational situations, because the over-all courses in which audio-visual materials are used have not been validated in the first place. The only notable and understandable exception has been in the area of programmed instructional-based educational technology. But even here, to return momentarily to the Department of Defense study, which the writer conducted, 39 percent of the programmed instructional-based educational technology courses within the Department of Defense were found to be without any validation data -- a disturbing omission which violates the basic philosophy underlying programmed instruction. I hesitate to say what the fact would be in the case of the commercial producers. Further, there has been very little systematic cost-benefit analysis made of audio-visual media employed either as segments of a course or as the main or entire vehicle for presenting information on a given subject matter. And still further, the entire area of stimulus modes, media, methodology, etc., needs much more empirically-based applied research on learning theory itself, and much more developmental effort than we have had to produce the larger margins of confidence needed in our attempts to utilize audio-visual media -- particularly those involving substantial investment in maintenance costs as we are getting in television and computer-assisted instruction.

Then, there is the persuasive and always present problem of the quality and learning effectiveness of the software that is fed into the instrumentation systems. This is becoming a matter of growing concern to educators, and a serious challenge to be met and overcome. The behaviorists' SR model, although not the panacea or the complete answer, forces us to meet the issues head-on. The behaviorist asking us to look at our terminal requirements in behavioral terms is forcing us to open up the Pandora's box of inefficiency and of sloppy and shoddy audio-visual and human-based pedagogy.

While seeking to apply the cold efficiency of business accounting procedures to the processes of education may be a wholesale misapplication of inappropriate methods to the profession, there is a case for developing within the profession a high degree of efficiency in determining costs of instructional programs. One of the many differences between cost analysis of business and education lies deep in the intrinsic differences between the two professions -- the first of which tends to deal in more readily tangible products on a relatively short-term basis, while the latter tends to deal in more esoteric outputs on a relatively long-term schedule. Thus, those factors which must be considered in support of the manpower argument have yet to be assessed with the efficient accuracy which marks many business accounting and policy problems, and, thus far, the manpower argument may have its best strength in the negative: what has been or will be the cost of not doing something? In education the cost of not teaching certain things is reflected not so much on the institutions but on the society in which they function -- in the same manner that few educational institutions enjoy direct profit from the knowlege which they impart at direct benefit of students and of society. The returns which an institution realizes tend to be less direct and concrete, yet, the operating costs of schools are very direct and concrete. One of the most difficult tasks for the school administrator is to relate his direct costs of paying for instructional programs to the cost of failing to buy and utilize them. The administrator must consider the value, and perhaps even the demand and supply factors, involved in the "productivity" of instructional programs whose results are measured in skills or knowledge learned. The administrator must decide whether given skills are worth, in terms of dollars, the real cost of the instructional program which guarantees imparting those skills. In projecting his budgets, he must be able to answer to a board of directors or a board of education when they inquire on the justifications for spending a given number of dollars for a given set of skills. In answering this, the administrator needs a reliable cost analysis which yields measurable factors that can be compared with measurable learning outputs. To fit his specific needs, a capable administrator may wish to develop a certain instructional program costing $120 -- this program might be designed to make up a small deficiency in a larger curriculum program. In terms of utility, it might be used during one year to teach "X" skill to 100 deficient children. The cost of that program would then be $1.20 per child. If, over a ten-year period it is used successfully to help 1,000 children, the cost of that first development is amortized to $.12 for each of the children. At the same time, the measurable educational output has been efficiently boosted for each of those 1,000 people by more than $.12 per child.

If one were to ask how educational output is translated into dollar terms, there is no answer that would not be arbitrary. If we could begin to identify educational output in precise, explicit and measurable dimensions, then it is solely a matter of judgment as to whether such output is desirable in accordance with certain dollar measures which shall result from the cost analysis. The administrative skill necessary to give us as full amortization as possible out of an instructional program is a viable that should not be considered in the capital investment required to establish the instructional program. For example, if a vending machine is not appropriately placed in a high density traffic area, the failure is attributable to poor management, not to an inadequate dispensing facility.

The success of American industry has been largely based on finding effective means of boosting output faster than work force and other production cost levels. This has been necessary in order to increase real wages, to attract capital for expansion, to pay dividends, and to accumulate surpluses for use in fighting obsolescence.

There are limitations, operational in nature, which are common to both industry and education. An educational system that underpays and overworks its labor force may expect to have difficulties with walkouts and serious problems in recruitment and loyalty. Further, voters who are unwilling to pass bond issues or endorse higher school assessments are the equivalent of unsatisfied or angry stockholders. It will be up to educators to produce effective solutions to such problems, especially to the problem of producing the demonstrable equivalent of boosting quality output faster than rising costs. Here again, farsighted educators may include the benefits of educational technology to increase their effectiveness, to prove unequivocably that such tools must be integrated into the total operation of educational process. Professional educators, the managers, will need to convince their stockholders, the public, that a superior product, the children's education, can be produced faster and more effectively through careful application of technological innovations which reach a greater number of real students at a lower cost per student. In order to be in a position to "sell" the need to utilize innovations, to modernize educational processes, educational management will need to utilize some of the techniques of industry and business management. The careful application of cost-effectiveness study is a prime example of such a technique needing transfer into education. By such transfer, the arguments of educational managers will have greater impact on a traditionally dubious public. Educational Policy Research, however, must not only concern itself with the desirability of applying "cost effectiveness" procedures to educational innovations but also to the means and processes by which these procedures will be applied.

Impact, in itself, will have to be striven for in not only the "selling" that educators will have to do to the public, but also in the very "teaching" or "learning experiences for students" that educators will need to improve for the students. There are few who doubt the impact that an Olivier or a Gielgud have in imparting the very stuff of Shakespeare to an audience, yet there are too many who know too well how the nasal monotone of an ungifted classroom teacher can kill the very life of any literature.

No student should be asked to complete his study of Shakespeare without seeing at least one of the great artists perform, no one should complete a music course without seeing and hearing great musicians perform. Language, like music, is a live thing. But only a very few students ever realize that it is so. Modern language has been too often taught as an exercise of rote instead of as a live method of communication. Some of the best schools have "language labs" in which tapes are used to good advantage. One cannot ignore dull essentials of vocabulary and grammar -- but, there are teachers capable of making these two aspects of language anything but dull, who,instead, make these things important and useful. These few, through technology, could easily reach and, in rare cases, "teach" all students. By putting these few on film, it would eventually be a real bargain to produce a million-dollar educational package that could reach tens of millions of students over a period of many years.

Foreign language classes of the future could use color motion picture travelogues containing foreign language subtitles printed and keyed to class proficiency. Students can thus absorb not only language, but geography, history, culture, and perhaps most important, a genuine respect for the dignity of other peoples.

Everyone realizes that educational technology is an infant, that teaching machines are in their infancy, and that the more important knowledge of programming education (in the "Programmed Learning" sense) faces a long journey toward development and maturity.

Yet, too few are aware of the magnificent potential such tools and knowledge offer to nearly every type of the myriad educational processes. Perhaps more tragic, is that too few realize the overwhelming imperative to apply, as soon as possible, the processes of scientific educational technology to the art of true teaching. Likewise, the processes of modern scientific management need to be applied to educational management.

Yet if administrators are to convince first of all their public, of both the potential of a more scientific educational system and the danger involved in failing to provide for modernization, they must incorporate a convincing cost-effectiveness that includes in its scope the many factors which enter into the economics of education. The critical test of their leadership is here and now in the present intensive drive to solve the crises common to the disadvantaged youth of our country.

Disadvantaged students reach the level of higher education in disproportionately fewer numbers, and tend to drop out in disproportionately higher numbers. Robert Weber has noted several reasons for this:

1. "Basic language arts problems, especially reading retardation, are evident.
2. The curricula of institutions are not perceived as relevant.
3. The students fail to experience requisite amounts of success experiences.
4. Financial difficulties are often insurmountable." (32)

Weber sums up by saying that such students lack sufficient mastery of the basic skills of the dominant culture, and financial inequality frequently disallows the opportunity of making up the difference. Thus equality, so fundamental to potential, is being denied in our schools in a time of great need. As a result, the gross national product suffers by the failure to maximize high pay-off investments in human capital. The nation needs to eliminate the status quo perpetrated by the failure to develop leadership through professional training of disadvantaged groups. Finally, Weber notes, the dissidence, despair, and even futility which result from human underdevelopment are threats to both security and cultural survival. It was this last consideration which prompted Sen. Fulbright to say at the University of North Carolina:

> "The elimination of poverty and inadequate education are at least as important to the security of our country in the long run as the maintenance of a strong defense establishment and a good deal more important than a voyage to the moon." (33)

The dropout rate of disadvantaged students, both at college and public school levels, stems in many instances from low-income status and learning deficiencies that are in turn due to inadequate primary and secondary education. It is an economic imperative, among imperatives, that the cycle of economic and educational poverty be broken.

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(32) Unpublished papers in personal communication to the author, 1967.

(33) Senator Fulbright, speech titled, "The Cold War in American Life", University of North California, April 5, 1964.

Weber notes another significant aspect in his study: "There is a generally observed phenomenon of cultural shock among Mexican-Americans and Indians admitted to institutions of higher learning". (34) Their severe problems of adaptation result from a different value orientation and value understanding resulting from cultural and geographical isolation. From this lack of opportunity to participate in a broad cultural life stems their inability to participate extensively in college experience.

In discussing the implications for our society and economy, Weber maintains that education is the best vertical mobility technique in our society; in fact, it is the only method through which democracy can realize its fullest potential. He notes that educational achievement of students is related to the educational achievements of their fathers. When this factor is correlated with income, there is a sharp focus on hereditary flow charts: where the father did not graduate from high school and family income was under $5,000, only 13 percent of the sons attended college; where the father attended college and the family income was $10,000 or more, 89 percent of the sons attended college. (35)

It is difficult to perceive how any society can be fully self-renewing when such a status quo is maintained. But, if such costs, as mentioned above, are not persuasive enough, there are other very compelling economic arguments. The dropout problem is revealed as an economic lunacy when the percentage of such students, out of the 5,435,000 now enrolled in higher education, is calculated.

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(34) Robert Weber, op. cit.

(35) Robert Weber, taken from Educational Summary, April 15, 1964.

This amount is so staggering as to constitute either abuse or outright waste of the multi-billion dollar facilities of the 2,000-odd institutions of higher learning and their 425,000-man faculties. The increasing costs of higher education only augment this problem. One estimate places the total current expenditures and capital outlay for higher education at about 12 billion dollars.

A frequent argument made by many national leaders is the one referred to as the "educational investment in human capital". The "investment in human capital" argument as depicted in the following table prepared by Dean Richard Wynn of the School of Education, University of Pittsburgh, is part of his argument for "Free College for Able Youths":

"1.	Average lifetime income of males with college education	$419,871
2.	Average lifetime income of males with high school education	241,844
3.	Difference in lifetime income between #1 and #2	178,027
4.	Average annual income of male college graduate	10,497
5.	Average annual income of male high school graduate	6,046
6.	Average annual income tax paid by male college graduates	1,693
7.	Average annual income tax paid by male high school graduates	676
8.	Average lifetime income tax paid by male college graduates	67,730
9.	Average lifetime income tax paid by male high school graduates	29,744

10.	Differences in lifetime income tax payments between #8 and #9	$37,986
11.	Estimated cost of four-year college education paid for by government	10,000
12.	Profit to U.S. Government (#10 minus #11)	27,986
13.	Annual profit to U.S. Government (#12 divided by 40 years)	700
14.	Rate of income on investment (#13 divided by $10,000)	7% " (36)

Caution is urged at this point. The problem, essentially, is what do these comparisons mean?

The danger here is that one will imply that the correlation is a causal one rather than a concomitant one. Social economic factors may be a very important factor and a common element in both leading to the spurious correlation. This is a possibility and should be considered as such. Other factors that should be considered are differences in I.Q., social status, family mores, etc. Although one should not ignore the requirement for a high school certificate and certainly a college degree for entering the more lucrative areas of work.

A recent article, "People and Jobs", by John Tebbel for *The Saturday Review*, notes the reasons manpower is in short supply while 3,000,000 Americans are unemployed. He finds that newspaper ads ask for teachers, engineers, doctors, policemen, pilots, toolmakers, physicists, journalists, middle-management executives, machinists, computer programmers, mechanics -- all jobs requiring *skills*. The word "skill" points to both the problem and its solution. For, while several millions are available as unskilled labor, the present job openings require a salable skill.

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(36) John Tebbel, "People and Jobs", *The Saturday Review*, December 30, 1967, p.8.

Most attention has been given to the ghetto Negroes who lack education and training in specific skills. Their frustrations and bitterness are the torches of urban unrest. Less attention has gone to those with at least a high school education but no marketable skill, frequently because their jobs have disappeared with automation. Theoretically, such people should be retrained for the newer jobs created by automation and other reasons, but that presumption is realized only to an insignificant degree.

Even though there are substantial increases in initial educational costs, the relevance to our economy and our society of solving the problems of higher education for disadvantaged youth, is quite clear. Inherent and long-range costs delineate between penalty payments (costs incurred for not doing what we should) and investments (profits accruing from doing what we should).

Tebbel notes that the unemployment rise in the last half of 1967 can be attributed in large part to "women whose office and factory skills were displaced by machines". This displacement rate is quickening and reaches from assembly line to white-collar middle management. There are four key elements in the economy contributing to the demand for more trained workers while displacing untrained help:

1. "Increasing orientation of the economy toward technology, which is neither sufficiently understood nor planned for by management.
2. Increasing sophistication of American environment. Every new tool, every new luxury, requires more trained man-hours for design, production and maintenance.
3. Physical growth of the economy. There are already so many people that the task of teaching, nursing, feeding, directing, and informing them is slipping out of control, especially in such critical areas as health and education.
4. Hot and cold wars. The economy has been paying for war, while,at the same time, the standard of living has been pushed up. (Here Tebbel maintains that 'the struggle of the have-nots against the haves is the central fact of international politics, but this phenomenon has only now come to America. In the opinion of the most qualified observer, it may lead to revolution here unless the manpower problem is solved'.)" (37)

Another aspect of the manpower crisis centers around some of the understandable,although inhibiting, effects of unionism. Many union contracts place severe limits on management that is farsighted enough to consider plans for retraining employees and for training additional people. Of course, unions do have legitimate interest in the job security of their members. The communication barrier between management and union leaders at this point must be dissolved so that the stultifying effects of short-sighted personnel from both union and management which seeks to solve present problems at the expense of long-term manpower needs may not be permitted to occur. Large companies often provide a dehumanized atmosphere in which losses in individual identity and the sense of accomplishment contribute toward manpower problems; management needs to become "more concerned with individuals than with badge numbers".

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(37) John Tebbel, *op. cit.*, pp. 8-9.

Such deficiencies are compounded by current attitudes. There is an acceptance of the growing disparity between the work life of the professional and executive man and the unionized workers. Management of the economy belongs to the former whose average work week is seventy hours. The latter, the majority, who carry out what is created and invented, are moving toward a 35 or 30 hour work week -- although not as rapidly as some might think.

The same trend exists in education based upon the ideal that education must be available to all. Thus educational resources are spread more thinly than ever before with quantity unavoidably taking precedence over quality. Teacher strikes in early 1967 were as much a protest of this as of unrealistic wages. The effects of endeavors to solve educational problems range from the discovery that the problem being attacked isn't the right one at all, through attainment of a partial solution, to achieving an optimal synergistic solution of such problems as college admissions, dropouts, and inadequate primary and secondary school preparation. Proposed solutions should accomplish the following:

1. "Destroy status quo-ism associated with class distinctions and educational achievement.
2. Significantly augment investments and return on investments in the gross national product through human capital resources.
3. Significantly diminish human resource waste.
4. Move universities to contemporaneity through co-operative and operational participation in problems of human growth and development.

> 5. Provide elite cadres of highly trained people who can meet critical personnel needs of rapidly expanding programs in traditional human development agencies such as Labor and HEW, Department of Housing and Urban Development (HUD), and the Office of Economic Opportunity (OEO)." (38)

If we are to make any headway at all in eliminating poverty, in bringing health and order to urban chaos, and in developing other programs beneficial to society, we need to greatly increase the number of "helping profession" personnel in areas such as teaching, nursing and social work, which prognosticators see in severe shortage by 1970 and beyond. In addition to filling the stop-gap need for such personnel, we need a new breed of personnel equipped with powerful, quantitative problem-solving tools, who can perceive and define problems using different analytical methods, and who can adjust to and initiate with facility changing concepts and practices. (39)

Weber maintains that large numbers of such key personnel can be produced without a degeneration of higher education standards. Yet, even more important for effective economic planning, is an effort to determine current and future shortages in key helping professions, and in the service sector generally. Examination of data over a reasonable length of time would produce patterns which could be utilized in forecasting and meeting future needs.

The following table shows the age distribution of the U.S. population:

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(38) Robert Weber, op. cit., p. 11.

(39) Robert Weber, op. cit., pp. 11, 12.

POPULATION CHARACTERISTICS
UNITED STATES (40)

PERCENT	YEAR			
Age Group	1950	1960	1970	1980
0-24	41.6	44.5	48.6	49.6
25-64	50	46	42.1	40.8
65	9	9	9.3	9.6

NUMBER (million)	YEAR			
Age Group	1950	1960	1970	1980
0-24	62.8	79.8	104	129
25-64	76	82.9	90	106
65	12.2	16.5	20	25
Total	151	129	214	260

In addition to the sheer increase in numbers, there are two specific items of interest. One is that the percentage figures for the 0-24 and the 25-64 are approximately reversed; the other is the numerical increase in the number of people over the age of 65. (41)

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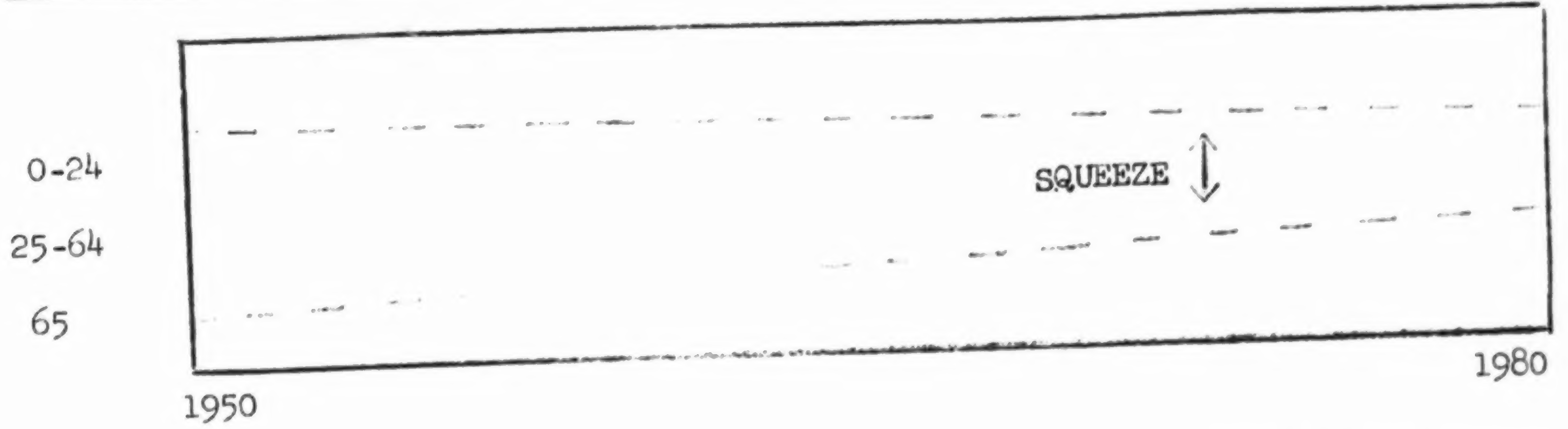
(40) Bureau of the Census.

(41) If the table were more refined, it would show such things as projected increases in the number of people over 80 on the order of 200 percent by 1980.

When the table is displayed graphically, as follows:



we are able to visualize the projected squeeze in the income producing segment of our society -- the age group that will have to pay not only increasing costs for itself but also for the other two age groups which will increase in size. (42)

A look at the percentages of the disadvantaged and impaired in our present school-age population, those who are and those who are not receiving service (the culturally deprived, mentally retarded, brain damaged, emotionally disturbed and physically handicapped), reveals that their number amounts to about 50 percent. A projection into 1980 yields us some sense of the enormity of preventive, remedial and developmental work that lies ahead.

As these imperative needs become critical shortages, the available capable personnel become proportionately fewer in number. The annual production of social workers is about 3,000 per year, whereas more than 15,000 new social workers will be needed annually from 1965 through 1975, to allow for growth in the profession, to replace persons who retire, die, or otherwise leave the profession. It has been estimated that the current production of teachers runs about 81,000 fewer than the number required for maintaining current student/teacher ratios. Forecasts through 1974-1975 show even greater discrepancies. Moreover, some educators estimate that from 6 percent to 25 percent of the teachers trained do not remain in teaching beyond a year or so after leaving school. Perhaps most critical is the shortage in the nursing profession in which the annual need is estimated to be 100,000 yearly through 1970, but in which the annual production rate is only 3,000. Thus, it is more evident that we are observing not a job shortage, but a skill shortage of severe dimensions. That shortage is further compounded by the college dropout problem.

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(42) Robert Weber, op. cit., p. 14.

Another important ramification exists in the arrest of development before college, when the high school diploma is terminal. The Labor Department has noted a "...shift in the composition of unemployed out-of-school youth. In October, 1960, six out of ten youths were dropouts, but by October, 1964, the situation was reversed and a majority of the jobless youths were graduates". (43)

A summary of the problem of education, both for the general population and, specifically, for those with college potential from low socio-economic and minority groups, when viewed in the broad context of manpower development, suggests three imperatives:

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(43) Robert Weber, op. cit., p. 16.

1. "Projected service needs of our population dictate the immediate design of programs to increase the number of youth in higher education, including long-range programs with a magnetic pull, powerful enough to draw children along from the elementary grades and to increase the holding power of institutions of higher learning so as to optimize the percentage who matriculate.

2. The phenomenal rate of exchange in our scientific and technologically advanced society, coupled with our recent detection of a pattern of growing unemployment among high school graduates, necessitates heightening of the skill plateaus of greater numbers of our population. Stated another way, we can no longer afford to be complacent about the arrested development of large numbers of our population who are capable of vertical mobility.

3. The concept of manpower development, when applied to sub-cultural and low socio-economic groups as part of a comprehensive attempt to move entire communities out of poverty, apathy, and despair, requires substantial increases in higher education for 'collegeable' youths who understand first-hand the problems and ways of poor communities and sub-cultural groups. Professional training, when coupled with this understanding, and the ability to communicate, can contribute importantly to the development of the leadership necessary for community and group mobility." (44)

With all these social and economic factors under consideration (to say nothing of the implicit moral considerations), we see some compelling arguments arising from this view of manpower development. In fact, to even use the term "manpower argument" is to understate the case: there are no foreseeable alternatives.

Within our control there is a range of deficiencies, especially in our educational systems which must be corrected. (45) The nation has been content with an educational system not geared to the new society. The system of teaching, counselling and directing students toward careers is inadequate, sometimes simply primitive. Parents, teachers, and counselors are not informed of a student's options, and they try forcing them into slots which high school and college curricula reinforce.

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(44) Robert Weber, op. cit., p. 17.

(45) Robert Weber, op. cit., p. 9.

To cope successfully with the growing imperative, education itself will have to make many rapid adjustments in function, at every level, from administrator to teacher. An important aspect of educational processes involves emotional climates and how they relate to teaching. Many teachers and leaders find it too difficult, almost impossible, to be warm and accepting, to love them. They are afraid of such a relationship because it threatens them in a most vulnerable spot, that part of their lives in which they have found it risky to attempt to love and be loved. Some people are often motivated -- rather unconsciously to be sure -- by the need to dominate, to punish, andto discipline. This need supports a barrier which they do not really know how to handle. Many teachers enter the profession because it provides them with exactly this type of sanctuary and gives them an opportunity to gratify their ego needs. A school provides a captive audience, one which they can threaten and control and which can be maintained at a "safe distance". Such teachers are primarily subject-centered rather than student-centered. They fear and avoid any relationship which amounts to a shared one, and they are further prevented from relating themselves by a sensitivity to demands of authorities above them, to factors of economic security and to criticism from administration and parents.

PART III

IMPLICATIONS AND PROSPECTS FOR A CENTER FOR EDUCATIONAL POLICY RESEARCH

Education, which by its very nature and scope involves a wide variety of disciplines, occupational fields, and types of personnel, is facing a need to provide its people with a means of bridging gaps between educational activities and research. Education is both an art and a science, yet has its very being in other fields. In order to communicate with art and the sciences, educational technologists must borrow from other fields, and, whenever needed, draw the leaders of those other fields into actively participating in the development of excellence in software. Such software is the heart of educational technology. Educational planners need to interact with representatives of other fields so as to build effective foundations within society. For these reasons, professional educators need a clearing house of information on educational developments throughout the nation and the world. They need the type of information which will lead to production. Policy research is needed at this point to determine the optimum input and output of such an information center.

It is proposed in this paper that the Policy Research Center combine educational policy research with demonstrations of viable policies and programs. An Educational Research Policy Center, independent of the Office of Education, and possibly reporting directly to both the Commissioner of Education and the Secretary of Health, Education and Welfare, must start by delineating problems which presently are barriers to broad scale educational innovation, particularly on the technological front.

A policy research center would fill many needs and provide many functions. For example, aid in providing policy guidelines, taking into account economic and social changes and the role of education and technology in helping students adapt to and make use of these changes, provide systems analysis, technology analysis, and management analysis to educators, evaluate, in an integrated manner, all significant areas of research and development for implications for social development. It is difficult to conceive of a policy research that is not related to all of these elements. Only a highly organized effort can accomplish these purposes.

A center could provide that systematic approach which insures that all possible answers are supplied to its director for use in helping others make policy decisions as to which innovative ideas ought to be carried down the tricky road from research to prototype development.

In its initial years, the center should research those policy issues which relate to the following:

- Promoting and catalytically accelerating and/or initiating development of education and training innovations and automated educational systems models.
- Monitoring experimental research on the part of the Federal Government.
- Shortening substantially the present lead time of basic and applied research, testing and evaluation, by pointing up operational implementation in the nation's education and training institutions.
- Providing guidelines for effective mechanisms for planned change in education.

- Establishing procedures for assessing education and training innovations in terms of these two factors:
  - a. Specific reductions in training/education time for appreciably more training/education per capita within a given time frame.
  - b. Substantially larger numbers of students in skills and knowledge tests.

Establishing co-ordinating and monitoring demonstration projects in educational and training systems which have nationwide application.

The center will have to maintain close liaison with national and regional educational research and media development centers and in lieu of another agency, serve as a focal point for nation-wide interest in, and study of, bio-and-educational cybernetics.

Along with the clearing house function, a major effort must be made towards the application of the systems concepts, already mandatory in educational and training research. A policy research program needs to study the extent to which the "systems approach" to education is or should become a matter of critical policy and determine the degree to which such policy will lead to the translation of all basic education and training into educational technology.

Among the problem-oriented policy issues which deserves high priority for study by the center should be "organizational innovation" -- determination of the degree of centralization necessary within the Office of Education or elsewhere in the Federal government to optimize educational innovative activity in public and private educational sectors. It would appear that an effective means of intercommunication among government and private agencies must be established, which will entail political maneuvering based on cost reduction data.

The function of these two activities would be to assess the types of policies which will demonstrate its usefulness and then organize to implement it more efficiently through education and training systems. Particularly important here is the need to sell the idea of applying "systems thinking" and "systems philosophy" to those education and training problems which have national scope and significance, problems such as adult illiteracy, preschooling of top quality for the disadvantaged, and retraining under-skilled manpower for full employability. National educational policy issues are imbedded in each facet of this complex problem.

Constant evaluation and adaption through rapidly processed feedback will be needed. Since social implications take a relatively longer time to become manifest than physical implications, it behooves the center's social and economic planning staff to examine proposed systems in microcosm, to experiment with model systems, to extrapolate distant implications from the immediate or proximal ones. In attempting to establish policies and suggest guidelines for given projects, the agency could use its broad fund of information to determine whether related or similar efforts might suggest solutions to specific problems faced by the project. If, for example, the process of applying educational technology in South America will be far less disruptive and far more effective than it otherwise might be, are the problems of such a project similar to the problems of the culture of poverty that we find in developed countries and in our own. If so, what modifications and adaptations are needed in transferring them to the new project?

Because empirical, developmental experiments are necessary prerequisites, answers to such questions related to the project could become "tentative probes" in an attempt to provide a framework from which the possible social implications can then be viewed. The policy research center should observe models on paper -- if not in action.

Given limited resources, concrete decisions must be made about goals and the time in which these goals should be reached. Through mass literacy programs and through radio can awareness be increased at a too rapid rate without concommitant increases in the standard of living? Would this create social chaos and promulgate a "crisis"?

Policy guidance is needed to determine whether one possible system would involve setting up Job-Corps-like centers utilizing recent educational technology: (1) automatic audio-visual devices to teach beginning reading, foreign language, and native dialect improvement; (2) self-pacing programmed instruction paper materials (such as the Job Corps Conservation Center Curriculum); (3) semi-self instructional vocational courses. Promising young people are accepted to these centers, taught and thoroughly familiarized with the system in such a way that some will become master teachers who will then operate satellite village centers utilizing the technology from which and about which they have just learned.

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By careful handling of such a program, by guiding the right persons to become involved in appropriate phases, the process of learning could involve enough citizens that business and industrial development could proceed quickly enough to meet demands of the newly aware populace. Exactly how industrialization will affect that populace, and how its people will respond to the needs of industrialization are illustrative of a few more of the many problems that policy makers will have to consider.

Within this country there are many adults who are virtually illiterate or otherwise seriously handicapped educationally. About 30 million members of the present work force are without high school diplomas, and 8 million have not completed eight grades. One-sixth of American youths cannot qualify for military service because they are unable to pass a seventh grade level examination. Two-thirds of the heads of poor families have less than an eighth grade education. "The data suggest that poorly educated workers will have even greater difficulty as the educational level of the labor force continues to rise and as technology reaches new levels of complexity. The prospect is not only that the number of jobs requiring little or no education will continue to decline but that nearly all jobs will require higher level skills and more education." (46)

While some observers feel that the future brings a society of leisure in which only a few favored people would be permitted to work--leaving the remainder to enforced idleness, others maintain that the serious difficulties which may arise as the result of continued automation will be resolved with effective planning. Continued automation, it is predicted, will make serious inroads on the domain of the white collar workers who are involved in low-level decision making. Further, technologically based improvements in consumer products will become a factor in forcing industries to prune a sizable proportion of jobs. Yet some see a shortage of manpower in jobs which do not require years of specialized training, jobs which could be created if planners focus on people and their needs to take care of each other.

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(46) From the Pamphlet--Unused Manpower: The Nation's Loss, U.S. Department of Labor: W. Willard Wirtz, Secretary Bulletin Number 10, November 1965.

Another area to which social and educational planners of the agency should give their attention is that of the inequality of education and the efforts that will continue to be made toward establishing a balance of school quality for the various racial and ethnic groups. Equality of educational opportunity has important implications which will need further attention if they are to provide guidelines for similar progress in various geographical areas of the nation and of the world. This is probably the most critical area of concern for the Center.

It must be accepted that technology and the developments allied with its progress have an inexorable effect on society. It is important to appreciate the relationships between the disintegration of some urban centers, and urban politics, and the radical changes which have come about in technology, mass communications and group structure. The fact that place is decreasing in importance in public life as people can travel further to work in dispersed locations, and as the economics of mass communications virtually eclips neighborhood news in favor of national and international news, have rendered the traditional city virtually ineffective as a "socialization and integration factory". As a result, urban citizens no longer participate effectively in their politics. Yet such participation is vital as a channel for maintaining stability and producing domestic change. It is a most important period of civic education in democracy; it is a basic learning experience. Therefore, planners will need to re-examine problems and possible solutions regarding the inner city, and will have to coordinate (catalytically) their work with urban redevelopment leaders.

Study will have to be made of those policies needed to demonstrate the usefulness of educational technology in its ability to meet changing manpower requirements. A massive effort using "continuous bombardment" is needed to make any effective progress. Not only "leadership" and "champions", "dissemination" and "demonstrations" are necessary, but so are "crises". Policy can inhibit or facilitate the development of selected educational and behavioral technology geared to potential crises situations. With potential crises in mind, programs could be developed for extensive teacher training, training of sub-professionals, Watts-area type education, medical technician training and for coping with any of the problems mentioned above. The question confronting educational policy research is what kind of policy inhibits and what kind of policy facilitates?

Another problem area deserving the concern and study of the Policy Center is that of institutional rivalry in education and training. This rivalry can be redirected into channels of interinstitutional cooperation, through publicity, for instance. It certainly would not hurt to have the President, influential statesmen, senators, congressmen or other individuals of national repute recognize and applaud those institutional programs which have demonstrated successful innovative efforts. How can educational policy play a viable role here?

A third area deserving study is the source of support of pilot projects which demonstrate the new "technologies and concepts." Even though such projects appear to be piecemeal, they could be coordinated to maximize the "demonstration on effect" to other federal agencies,departments, congress, and leading educators in crucial positions. Other measures would be to develop projects which show the greatest increase in performance (if, for example, one particular school system is "ahead" through certain "innovations", it might not be the likely place to initiate other projects); carry out several "eye-catching" projects--perhaps in training several hundred mentally retarded children. Moreover, it is important to utilize industry as much as possible, not only because it is willing to cooperate for long-term profit reasons, but also because it can advertise and inform the public while the federal agencies could hardly do so without being charged with "waste". The Office of Economic Opportunity is successfully utilizing this approach in the Job Corps. Eventually, this is the "logical" approach to introducing systems thinking and organizational innovations into educational and training programs, prior to supplementation by politically oriented action.

Another problem which should be dealt with separately is the cost factor of instructional hardware; e.g., the teaching machines, the computer-directed classrooms, etc. Policy research should assess the degree to which immediate application of existing techniques in development, testing and engineering should be undertaken rather than further basic and applied research. A cursory examination of the "behavioral technology" educational industry indicates that much parallel R & D has been occurring in the private sector and in universities. Also, the majority of companies realize that the $34 billion "education industry" is among the fastest growing markets in the economy; hence, most companies are willing to forego immediate profits merely to get a footing in the market. As a result, projects sponsored by government agencies should have extreme bargaining power in that most companies would welcome the chance to prove their hardware and build up their reputation in the market. Similarly, with the general tendency of federally financed R & D contracts to allow contractors to retain title to patented inventions, there is added inducement for business to seek government contracts.

Another policy consideration regarding instructional hardware is, how much standardization is wanted. Ordinarily, mass production leads to lower production costs. But the counter-balance here is the fact that rapid obsolescence will undoubtedly occur and such standardization as in an impetus to innovation in period "one", could well be an obstacle in period "two."

Studies are needed and should be initiated to specify the kinds of policies needed to allow for the latest scientifically derived procedures to develop not only educational systems but also the structure and content of specific education. Procedures need to be developed which will provide assistance to school administrators in reviewing and evaluating would-be innovations, present educational programs, and/or learning and instructional systems, in terms of their ability to produce the required kinds of quality and achievement in student performance. Present policy prohibits the Office of Education from actively pursuing such a program.

Persons involved with the pilot project of the center will have to reconcile additional problems such as the following:

. The proposed policy center will have to use and project currently existing data, not to generate new data based on (new) experimental research or to sponsor original research or have control over it.

. Since the main purpose will be to engage in strategic kinds of thinking, systems analysis, and guidance of fund allocation for additional research, the Center will be required to employ interdisciplinary approaches and, especially, to draw models from the physical and biological sciences. Complementary, and not overlapping, activity should be stressed.

- Serious consideration must be given to assembling the right type of people who will be capable representatives of the numerous disciplines.

- It will be necessary to clarify relationships of the Policy Research Center to the overall Bureau of Research of the Office of Education, and stress will have to be placed on interactions and exchange among the Operational Centers, the Office of Education, and all relevant agencies, organizations and people.

- Since there is difficulty in mounting policy research when a group of people are ideologically committed, such groups should consciously explore alternatives, competing educational goals, and ideologies. Providing a diversity among personnel will stimulate the dialogue and the recognition of all views that are necessary for policy research. Yet, because there is also the problem of a methodology's being any more than relatively value-free, probably the most that can be asked for is identification of possible goals, not a "setting" of goals.

- To avert the danger of so centering on education that the future orientation may become distorted, it is crucial that all functions and efforts be evolved from a broader analysis of underlying social and economic forces. By so doing, we will insure that as many different perspectives as possible will be in the "policy pot". An input of rational, humanistic, intellectual elements must be included.

- Among the problems in information dissemination, it should be recognized that those who are most competent in conceptualizing may not necessarily be the most competent in communicating. Further, from the

Center, guidance should be forthcoming on the impact of policies which will determine what information goes to whom, in what form, and how often, etc.

. As cooperative and collaborative undertakings are encouraged during the pilot phase of the program, there will be difficulties ranging from accounting to communication to geography and mainly to the need for strengthening the organizations involved. The Office of Education should remain neutral and it should be up to the regional or pilot centers to decide on initiation of joint proposals.

Policy research for educational requirements of the future must be relevant to necessary R & D which will, on several phases, effectively produce educational change. In the first phase of the R & D paradigm which is largely basic research, the question which is asked is, "How do people learn?" Findings in this phase are "useless" in the sense that they rarely, if ever, have any immediate application. More work must follow, and to resolve this difficulty it will be most important to have the Center maintain coordinating liaison with regional laboratories in order to study the kind of policy which needs to be developed which will determine the kind of follow-through action which is necessary.

The second phase, program, design, tries to answer the question, "How should people be taught?" This phase tranlates what we know about learning into instructional programs.

The evaluation-through-field-testing phase seeks to answer this critical question, "Does the instructional program teach?" During this third phase the program design is systematically tested "to find out what it will accomplish under what conditions." Since so "little is known about conditions which affect learning in the school," it becomes necessary to provide broad field testing that "will reveal the whole range of situations in which an innovation will prove valuable." It is a crucial phase in successful research and development.

After the program has been successfully field tested and evaluated, it has to be demonstrated in circumstances which are ordinary, unenriched, and normal.

Between phase one (basic research) and phase two (program testing) the systems analysis and design approach, following an R & D cycle of exploratory, advanced and engineering development toward production of physical models is likely to be adopted or initiated by the complete spectrum of public and private education to the extent that policy is permissive rather than inhibitory.

Research and exploratory developments need to be judged on their own merits, in relation to the advancement of knowledge of the learning process across the entire spectrum of science and technology of pertinence to the education effort. Secretary of Defense McNamara pointed out that:

> "All too often in the past, new technology efforts had to be justified in terms of an end product development. This approach resulted in the initiation of large numbers of system developments for which the basic technology had not yet been created. And because of the large number of projects, the available funds were not adequate to pursue all of them at efficient and orderly rates. As a result, many ended in failure or were overtaken by new technologies and eventually had to be terminated before completion." (47)

While research and exploratory developments do not necessarily have to be directly related to specific (education) requirements, a full-scale engineering development or operational systems development can be justified only in terms of its potential contribution to a national educational requirement and strategy, considering both cost and effectiveness. This is policy consideration of critical importance. Care should be exercised so that, as in the case of many past systems developments, work is not started before consideration has been given to how the proposed learning system would be used, what it would cost, and finally, whether its contribution to our (human) capability would be worth its cost.

An awareness of the possibilities of extensive R & D efforts in educational technology and their relationship to policy was lucidly expressed by Dr. Simon Ramo, president, Bunker-Ramo Corporation, in an address presented to the Aerospace Education Seminar of the Air Force Association. He claimed that, ". . . . perhaps the most important area of technology that remains before us for the next several decades is the extension of the human intellect by electronic devices and the consequent creation of a much greater amount of brain power for the nation."

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(47) Robert S. McNamara, Statement of Secretary of Defense, Robert S. McNamara Before House Armed Services Committee on the Fiscal Year 1966-70 Defense Program and 1966 Defense Budget, Feb. 18, 1965, Washington, D. C., U. S. Government Printing Office, 1965, pp. 165-169.

To continue in Ramo's statement mentioned above: --Not only attorneys, physicians, engineers, legislators, librarians, school teachers, but teachers and school administrators could, in Ramo's words--

> ". . . . some decades from now use a console on their desks, much as today we use telephones to obtain information to check out decisions made against statistical situations, to diagnose illnesses by putting in the facts and having pertinent cases brought quickly to their attention, or to check actions they wish to take between individuals or corporations. Information could feed into the console, analyses made, decisions altered, all in a split second." (48)

He pointed out that "with that kind of intellectual, informational and technological accommodation the brain power of the nation would be greatly increased." With respect to education he emphasized "the possibilities are, of course, obvious, and it is possible, in effect, to get the equivalent of extending the brain power of human educators manyfold, just as a physician does a better job today because he has the cardiograph and the x-ray machine and the blood tests and the electro-encephalography, in a similar fashion the educator will be able to do a better job by having records at his fingertips not only concerning what the student, in accordance with the tests that he has taken, should apparently be taking next, and what exceptions seem to apply, so that all of the items so difficult to remember, so difficult to get information on, on millions of students will be available."

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(48) Dr. Simon Ramo, Address before the Air Force Association Aerospace Educational Seminar, Washington, D. C., Feb. 5, 1964.

Developments having national scope are desirable to presage the need for a coordinated nation-wide effort in research and engineering development programs for educational technology.

It is patent that research scientists cannot be expected to be the sole agent of change in our society. They can be encouraged to innovate, to pursue for "truth" and "utility," but not practical research and all the applications. Holding the scientist to his commitment and charge to do an acceptable job of designing and conducting the research, the nation must organize or institute procedures to translate the results of valid research into viable technology and action.

It would be extremely difficult at this time to find any person or office or agency within the national structure charged with the mission of research surveillancein education and training so as to identify those research studies and results which are deserving of exploratory, advanced and ultimately, engineering development efforts. Apparently no one is doing this for the Commissioner of Education or for the Secretary of Health, Education and Welfare. To this writer's knowledge no one has been charged at any departmental level with such information surveillance. The need for this type of policy determination deserves critical attention.

Although research efforts to date have been significant, and encouraging, much more must be done. Major General Donald R. Ostrander has pointed out that there "must be a communication link between the person who creates new knowledge and the person who recognizes a use for it; *and between that man and the people with problems to solve.*" The best communication link that can be provided is the engineering development of innovations. The primary need is a "wind tunnel" for the testing and development of education and training systems. (The wind tunnel does not fill the same function as a test tube, however.) Such effort, building on the information provided by a clearing house or a group such as the Educational Media Council, or other information disseminating activity, will most likely produce the test and demonstration models for the necessary innovations. Policy issues here are related to the degree to which the government will centrally direct not only the nature but the course of educational innovations.

National level research and engineering development efforts can catalyze instructional research projects as they may be applied to both theoretical and practical educational problems. These national efforts should not replace other educational research organizations, but should supplement their activities and provide direction in crucial areas.

Again, research and development efforts raise policy considerations of critical importance.

The ultimate aim is to have as much innovative research in training and education (in addition to efforts specifically directed at some specialized problem) as now goes with aero-space, communications, medicine, and other fields. This effort will take place when the nation's survival and progress is effectively related to education and when the nation realizes that the savings attributable to research and engineering development in instruction should more than cover the cost of that research. That realization should be made relative to the critical issues within the problems of equality of education.

It is not a part of this argument that the Office of Education and other agencies have not been sponsoring or conducting adequate research programs in education and training. On the contrary, a great deal is being done and much of it is very good research. But it is our thesis, however, that literally nothing has been done to translate education research findings into useful and meaningful applications. Further, research efforts have been scattered, uncoordinated, and seldom organized in systematic approaches to problems or systems analysis oriented, even within a given department or state or local school system.

The problem is further aggravated by the lack of any national agency to assume some responsibility for the universal adoption and adaptation of proven innovations in education and training. The customary view of the R & D investment in training and education, being localized, does not maximize the return on this investment, since it fails to regard the entire national education and training spectrum as fertile ground for the adoption of educational training innovations and automated learning systems.

The policy center should study the relationships in education both within the United States and abroad. An engineering development program of wide scope throughout the nation will affect the entire field of education and instruction throughout the world. Nationwide exploratory study of programmed instruction technology has not only contributed handsomely to the growth and development of instructional technology in this country, but also to the interest in programmed learning and resulting teaching-machine technology in England, Germany, Sweden, Canada and numerous other countries. Therefore, there are international implications and an involvement with international policy with respect to such matters as the "brain drain," etc.

The competition in educational technology between the Communist and the Free worlds will intensify in the years ahead. The United States can play a strategic role on behalf of the Free World in this competition. The emphasis placed on education and training by the communists needs no repetition. It has been recognized that the Soviet Union is devoting considerable research to the development of educational and teaching technology and to bio-cybernetics. Cybernetics, with its emphasis on potential for computer-based instruction, has received top-level government support in the USSR, where a unified plan for the research and development of programmed instruction technology for 1964-65 was prepared by the Ministry of High Education and Specialized Secondary Education and the USSR Academy of Sciences. The RAND Corporation report concluded that, "Much of the Soviet planning, economic as well as military, hinges on computer technology and its applications (of which teaching machines are only one example)." The prospects of automation's providing a basis for producing educational and technical training are apparently most appealing to the Soviets.

The high costs of existing education and training programs and proposed innovations, the need to match the education and training technology of Soviet Communism, the potential benefit to all training and educational agencies of the Free World, and the critical civil and urban problems existing in United States cities, make imperative the requirement for a new administrative structure whose business is instructional innovation and automated education.

This proposal centers upon the missing links in the national education training chain, identified as three complementary functions:

1. "A clearing house function
2. A research and development coordination function
3. A policy recommendation function (implicit in the first two functions)."

The educational policy research center, among other matters, should concern itself with studying the degree to which national educational policy should channel resources to investigate such areas of educational technology as programmed instruction, educational television, films and other audiovisual functions, special instructional devices (including computers) and methodology in general. The Center would not presume any authority as a control agency but rather would assess the kind of policy necessary to get either proliferation of, or restrict the application of, educational technology.

In summary, the requirements exist for a new national agency, long on dimension, impact and promise. The Federal government needs to establish an inter-agency structure to advance a coordination of national efforts in education in any way similar to the National Institute of Health's work in areas of physical and mental health. Within the fast changing and growing complex of manpower skills, education and training requirements and resources, there would then be a Federal focal point providing an overview and/or over-all policy management and policy guidance for government supported efforts in education.

The Center should be proceeded by a task force which will produce broad policy guidelines and implementation plans through which the proposed Center would function. Existing presidential committees would be appropriate forums for establishing the task force, working closely with the present pilot centers. The President's Federal Inter-agency Committee on Education and the President's Committee on Manpower could jointly call upon the various agencies concerned to appoint members to this new inter-agency task force. The concern of the inter-agency task force should then be with the basic concept for structuring a viable organizational system for a policy center that would in large measure insure balance, quality, coordinated direction, economy, and effectiveness in educational policy research and determination.

ECONOMIC CHANGES, MANPOWER REQUIREMENTS, AND THEIR IMPLICATIONS FOR EDUCATIONAL POLICY IN THE NEXT TWO DECADES

by

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I. INTRODUCTION

Education affects every aspect of our life in a modern society. Education provides individuals with the opportunity to develop their talents and abilities. It helps build effective citizenship essential for improving our society and provides much of the needed training to meet the growing demand for skilled manpower. Above all, education is one of the deepest roots of the nation's economic growth, by advancing technology and enhancing the productivity of workers.

This study is concerned with the manpower requirements approach to assessing educational needs. This approach to educational planning implies that the nation's economic growth presupposes a particular occupational composition of employment, generating demands upon our educational and training institutions. The function of an educational system in this sense is to provide the requisite numbers of personnel with the appropriate skills which that occupational structure demands.[1/] Thus, an examination of the nation's prospective manpower requirements and of the subsequent needs of skill development can serve as a useful guide in planning educational and training programs. The emphasis of this type of approach, however, does not mean that manpower requirements ought to be the sole criteria in determining the aims and needs of education, but rather that they simply indicate the magnitude of anticipated needs if a given target for growth upon which they are based are to be met. We must be reminded that education serves many non-economic ends for our society.

[1/] Among many literatures on the subject of manpower approach to educational planning, see, for example, Herbert S. Parnes, Forecasting Educational Needs for Economic and Social Development. Paris: Organization for Economic Co-operation and Development. October 1962 and Hector Correa, "Measuring Education's Contribution to Economic Growth," in Educational Requirements for the 1970's. Edited by Stanley Elam and William P. McLure. New York: Frederick A. Praeger. Published for Phi Delta Kappa. 1967.

The purpose of this study is to assess the economic changes anticipated in our society and their probable implications for education in the next two decades. These economic changes and their implications for education are illustrated by reference to the shifts in manpower requirements which are expected to occur in the next decade or two because of technological change, rising income and output, greater leisure, higher levels of educational attainment, the spread of urbanization, and the pursuit of national objectives in such areas as health, urban development, or national defense.

II. THE SOCIO-ECONOMIC FRAMEWORK IN THE 1970's AND 1980's

The social and economic institutions of the United States have undergone considerable changes over the past half century. One of the most remarkable achievements of this period has been the continuous improvement of our educational system and the rising level of educational attainment of the American people.[1/]

The social, political, and economic developments of recent years have accentuated the demand for education as well as the resources for its satisfaction. The expansion of the affluent middle class in the nation's economic structure raised the aspirations of the American people and created new educational demands. The rapid growth in the nation's economy and greater productivity have made it possible for the nation to

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[1/] See John K. Folger and Charles B. Nam, Education of the American Population, A 1960 Census Monograph. Washington, D.C.: U.S. Government Printing Office, 1967.

channel more resources for the care and education of our population. The scientific and technological revolution resulted in a substantial change in the quality of the work force required by the economy, and it imposed an added task on education. Increasing urbanization with the concentration of the poor in our central cities called for a new kind of educational program suitable for the urban community. With the mounting complexity of world affairs, our educational system is called upon to provide more meaningful civic education for all ages of our population so that they may contribute more to the peace and well-being of the world as a whole.

The social and economic changes such as these have resulted in a sharp rise in school enrollments, and at the same time have brought about considerable changes in the content and the meaning of education. The conduct of education thus reflects, and is being reflected by, the changing social and economic scene. If the nation is to meet enormously increased educational challenges in the future, it is essential that we have a clear understanding of how the nation's socio-economic structure will change.

1. Rise in Output and Income

The nation's economic growth, which over the past three decades has averaged approximately 4 percent per year, has been one of the miracles of our economic history. In spite of the still prevailing and widespread substandard living in certain segments of our society, the nation as a whole has developed the most productive economy the world has ever seen and attained the world's highest living standards. It is anticipated that this long-term growth trend will continue over the next two decades. The nation's economy is expected to grow in many dimensions -- in total population, total employment, total production of goods and services, and personal income. The economic framework indicating the estimates of major economic and demographic projections for the 1970's and 1980's is shown in Table 1.

TABLE 1

Economic and Demographic Projections, 1962, 1964, and Projected to 1975 and 1985

Items	1962	1964	Projected Years 1975	Projected Years 1985
Total Population (in millions)	186.7	192.1	223.8	264.6
Civilian Labor Force (in millions)[1/]	71.9	74.2	91.2	105.3
Civilian Employment (in millions)	67.8	70.4	87.6	101.1
Average Weekly Hours of Work	38.7	38.5	36.8	35.5
Total Man-Hours (in billions)	142.1	146.3	173.0	191.2
GNP (in billions of 1964 dollars)	576.7	631.7	1,025.0	1,547.0
GNP Per Employee (in 1964 dollars)	8,510	8,970	11,690	15,300
Personal Income (in billions of 1964 dollars)	453.2	496.0	849.4	1,280.0
Personal Income Per Person (in 1964 dollars)	2,430	2,580	3,800	4,840

[1/] Based on the total labor force definition of persons 14 years of age and over.

The total volume of goods and services is projected to rise in 1964 dollars from $630 billion in 1964 to over $1 trillion in 1975 and to $1.5 trillion by 1985, an increase of almost 140 percent over a period of two decades. This projection implies an average annual growth in total output to 1985 of about 4.3 percent from the 1964 base year. A projected increase in output of this magnitude would provide greater resources for the nation to overcome deficiencies in education, health, in coping with poverty, and other fields. Continued growth of output is important to relieve much still prevailing and widespread substandard education in the slum areas of the country. It is much easier to meet mounting public needs in a rapidly growing economy than in one in which there is little change over a period of time.

Because economic growth broadens the tax base, the revenue raising power of the federal tax system rises at constant tax rates more than proportionately to gross national product or income. It has been estimated that in recent years federal individual income tax payments have been automatically rising 50 percent more than the percentage increase in personal income.[1] State and local taxes, the main sources of school revenue, are generally considered less sensitive to changes in income, but they too respond to changes in economic activity. Previous investigations by economists suggest that state and local tax bases grow almost proportionately to the income or gross product. With proper financial arrangements between the federal and state-local sector, the revenues available for education can be expected to increase substantially in the next decade or two.[2]

Expenditures for education have been rising at a more rapid rate than GNP over the past two decades. Expenditures for all levels of education increased by more than a ten-fold from $3.5 billion in 1944 to $36.6 billion in 1964. As a claim on resources, these expenditures represent an increase from nearly 2 percent of GNP in 1944 to 6.2 percent of the much larger GNP in 1964.[3] If we continue to spend in the next two decades the same proportion of GNP as in 1964, the growth (4.3 percent per year) of our economy's resources along will yield an additional amount of $56 billion (in 1964 dollars) for use in education by 1985. The additional resource yield such as this may mean the difference between reasonable success and failure in attaining the nation's educational objectives inthe future. Continued growth of our economy would permit greater expenditures for education in the form of better school facilities, libraries, teachers' salaries, and increased teacher supporting staff. This in turn may require a considerable amount of planning for educational facilities and teacher training programs.

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[1] William H. Waldorf, "The Responsiveness of Federal Personal Income Taxes to Income Change," Survey of Current Business, December 1967. pp. 32-45.

[2] See, for instance, Dick Netzer, "State-Local Finance in the Next Decade," in Revenue Sharing and Its Alternatives: What Future for Fiscal Federalism? Vol. III. Prepared for the Joint Economic Committee of the Congress. Washington, D.C.: Government Printing Office. July 1967. pp. 1332-66.

[3] U.S. Office of Education, Digest of Educational Statistics, 1966. Washington, D.C.: Government Printing Office, 1966. p. 18.

One important aspect of our economic growth that affects us most as individuals is the continued improvement in the standard of living of the average American family. The rising income of the population plays a significant role in pursuing our national objectives. Higher family incomes in a growing national economy raise the standards for public services and increase the capacity to pay taxes.

The rise in family income over the past several decades has brought most Americans to a way of living formerly enjoyed only by the well-to-do. As recently as 1929, only one-third of American families had incomes as large as $4,000. In 1963 every five families out of seven enjoyed an income of at least that much or more. It is expected that by the mid-1970's five families out of six will earn incomes of $4,000 or more annually.1/ With the overall economy growing at the annual rate of 4.3 percent, total personal income in 1964 constant dollars is projected to rise from $496 billion in 1963 to about $850 billion in the mid-1970's and to nearly $1.3 trillion by 1985 (see Table 1). This represents a growth of about 4.5 per-

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1/ Estimates are based on 1964 constant dollars. See National Planning Association, National Economic Projections to 1976/77, NEPS Report No. 66-N-1, p. 59.

cent per year over a period of two decades. About a third of this percentage, however, will be absorbed by population increases and the remainder indicates the enlargement of income per capita. This rise in income will be reflected not only in new consumer durables, such as a second car and dishwashing machines, but also in improving standards for public transportation systems, adequate school programs in central cities, and health and medical care programs. With rising incomes, a greater proportion of American families would be able to bear the costs involved in extending the education of their children through high school and college.

2. Economic Growth and the Role of Education

The view has generally been accepted that education not only provides individuals better opportunities in the labor market but also yields substantial economic returns to the individuals as well as the national economy as a whole. More highly educated and skilled persons tend to earn more money than others. In 1965, for instance, a man who graduated from college (4 or more years of college) could expect to earn $185,000 more lifetime income than the one with only high school education.1/ It is further interesting to note the dynamic aspects of the income-education relationship. Over the last two decades the better educated persons have made greater relative gains in expected lifetime income than the less educated. In 1946, college graduates could earn nearly 48 percent more than the high school graduates. Nineteen years later, however, the difference increased to over 62 percent, reflecting a greater relative gain for the college-educated.2/

1/ U.S. Bureau of the Census, Statistical Abstract of the United States, 1967. Washington, D.C.: Government Printing Office, 1967. p. 117. Although the data tend to indicate that for the typical male there is a substantial monetary return from investments in education, there is no guarantee that any given graduate will always earn this rate of return. Part of the higher income of those with more education could probably be accounted for by differences in innate ability, social status, family connections, and other factors.

2/ Herman P. Miller, "Annual and Lifetime Income in Relation to Education: 1939-1959," American Economic Review, December 1960. p. 981 and Statistical Abstract of the United States, 1967. op. cit.

While there is general agreement that the educational attainment has a positive influence on the level of income of average persons in the total population, the role of education in determining the level of income of various minority ethnic groups is unclear. A recent study reveals that a given level of educational attainment tends to have lsss income value for members of disadvantaged minority groups than for the majority "Anglo" population, and that minorities will not achieve income parity with the majority by improving educational attainment alone.[1] It is found that discrimination and the quality of education, among others, are some of the important variables for explaining ethnic income differences which cannot be accounted for by educational attainment.

If we are to upgrade the economic status of the minorities and to increase their contribution to the nation's economic progress, it is necessary, in addition to providing more educational and training programs, to break down the social barriers which restrict opportunities for these segments of our population. Education would simply result in a waste of time and resources if even the well-educated are forced to accept low-paid menial work because of their color or nationality. It also follows that policy-makers might do well to direct their attention to the content and "quality" of educational programs as well as "quantity" or level of educational attainment of these groups. Greater investment in better and adequate educational programs is one way of improving the abilities and motivations of the disadvantaged. If the nation is to continue the successful economic growth throughout the next two decades, every effort will have to be made to assure the continued improvements in the quality of all segments of the labor force, especially the minorities.

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[1] Walter Fogel, "The Effect of Low Educational Attainment on Incomes: A Comparative Study of Ethnic Groups," The Journal of Human Resources, Fall 1966, pp. 22-40. Selected

Improving the quality of the labor force through upgrading of the educational background has made a considerable contribution to rising labor productivity in the past. In the United States only about half of the growth in output is said to be coming from increases in conventional factor inputs -- labor and tangible capital stock.1/ A significant proportion of the growth in output may be explained by increased productivity brought about by increases in "human capital" such as investments in education, health, and the like. According to John W. Kendrick, "human capital" is estimated in 1966 to have accounted for a third of the total national welath of $6 trillion (in 1958 dollars) in the United States.2/ Edward Denison estimates that nearly a fifth of the projected growth rate of national income between 1960 and 1980 would come from increased education of the labor force.3/ A well-educated and properly trained work force is an essential ingredient for continued economic growth and technological advance. In the coming decades the promise of further economic progress will likewise depend heavily upon improvements in education of the labor force. Without adequate educational programs, the potential growth of our economy may not materialize.

3. Advance in Science and Technology

We are living in an age of scientific and technological revolution. Rapid advances in science and technology since the turn of the century have revolutionized the environment and conditions of human existence.

1/ John W. Kendrick, Productivity Trends in the United States, Princeton, N. J.: Princeton University Press, 1961. p. 60.

2/ Total Investment and Growth of the U.S. Economy. Paper presented before the annual convention of the American Statistical Association, December 30, 1967.

3/ "Measuring the Contribution of Education to Economic Growth," in The Economics of Education. Edited by E. A. G. Robinson and J. E. Vaizey. New York: St. Martin's Press. 1966. p. 234.

Scientific and technological progress has gained considerable momentum especially since World War II. Revolutionary changes in the fields of weapons technology, exploration of the outer space, plastics, electronics, and laser beams are widely recognized. One of the most significant post-war developments in technology would probably be the electronic computer. Computers in the field of medicine are diagnosing diseases, keeping patients' records, helping run hospitals. Electronic machines in school classrooms are adding a new dimension to teaching and training. Data-processing techniques are becoming widely used in banking and finance. Our exploding scientific knowledge and advancing technology are, however, constantly reminding us of the fact that human endeavor has not yet fully exploited many areas of knowledge. Recent experiments in the human heart transplant and the test-tube creation of "life" called DNA underscores the significance of latest scientific achievements in the exploration of new areas.

Looking ahead toward the next two decades, the continued advance in science and technology will give us a much more comfortable environment for work and living. Improved technology in production will continue to cut short the labor time required per unit of output of goods and services, and it will provide us with the means for a higher standard of living as well as for more leisure, accompanied by shorter hours of work, longer vacations and earlier retirement.

It is, however, increasingly important to recognize that technological progress may also create some serious problems and bring with it some undesirable consequences. Some of these may involve harmful effects of drugs, radiation, pesticides, and air and water pollution upon the health and safety of our community. Some of them may also involve the impact on human privacy, resulting from the widespread computer and electronics technologies. Increasing leisure time which comes to us as a gift from technological civilization and how to creatively utilize it will present a serious educational challenge in the future. Transplantation of vital human organs, which symbolizes a new era in modern medical science, poses new legal and moral problems for the physician and for the society as a whole. Still another concern is the widely held view that the effects of automation will eventually displace many workers. Developments in science and technology have labor force implications not only in terms of displacement and adjustment, but also for those new workers who are or will be preparing for a vocation and who will seek their job in the future labor market. Thus, it is vitally important that to prepare for the future we must be aware of how much we will be paying for future technological advance in terms of these various external costs.1/

The manpower implications for education and training are profound. Technology demands better skills and wholly new concepts of renewed education throughout life. As new machines and automatic devices relieve men of much manual effort, there will be fewer and fewer opportunities in unskilled and semi-skilled jobs and greater demands for professional and technical occupations which require higher degrees of training and education. What new skills might be needed and what skills will become obsolete over the next two decades will affect greatly educational programs the schools of the future will offer. The role of education in the age of science and technology is well stated by Thomas J. Watson:

1/ Gerhard Colm, "Economic Aspects of Technological Development," Technology Transfer and Innovation. Proceedings of a conference held under the auspices of the National Planning Association and the National Science Foundation. Washington, D.C.: U.S. Government Printing Office, 1967. p. 87.

> "Educators at all levels now realize that education must enable graduates to undertake later career changes and be flexible enough to meet them successfully. Education and re-education must be a continuing process throughout the careers of most young people in school today. The range of problems facing them in the next ten years, in economics, space science, automation, life science, and almost every other field will demand far more open minds, and far better trained ones, than ever before in man's history." 1/

4. Increasing Leisure

One of the most pleasing aspects of improving American standards of living is increasing leisure. Americans will continue to enjoy more leisure time that comes to us as a gift from advancing productivity, and they will benefit from rising incomes. An average American worker is expected to gain much more leisure time in the next two decades than in the past, the equivalent of an additional four weeks more a year than in 1964. The greater leisure would partially be taken in the form of a shorter work-week and in longer annual vacations. The sabbatical leaves now largely confined to steel workers will probably expand to include many more workers.

With incomes expected to rise from about $2,600 per person in 1964 to over $4,800 per person by the mid-1980's (both in 1964 prices), consumer preferences will undergo considerable change and significantly affect the demand for various goods and services and for leisure time. The increase in income and spending is expected to be accompanied by greater than proportionate increases in consumer spending for durable goods and services. Consumer purchases of services, such as education, health, travel, and

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1/ Thomas J. Watson, Jr., "Technological Change," in Goals for Americans: Programs for Action in the Sixties, Report of the President's Commission on National Goals, Prentice-Hall, Inc., 1960. p. 201.

other recreational activities, will account for approximately 44 percent of total personal consumption expenditures in 1985 as compared with about 40 percent of the total PCE in the mid-1960's. The increasing amount of leisure time anticipated to be available in the future is expected to encourage many Americans to participate more actively in a wide range of free-time-using activities such as recreation. During the post-war period of 1948-1964, consumer spendings on recreational activities as a proportion of total personal consumption expenditures have increased from 5.6 percent to 6.1 percent.[1/] Sustaining this rate of growth over the next two decades, expenditures on recreation will amount to about $70 billion by the mid-1980's, accounting for 7 percent of the total personal consumption expenditures.

The question of how to best utilize the increasing leisure time is the concern of educators and the business and labor leaders. It has been suggested that we ought to place greater emphasis on the creative use of leisure rather than on passive mass amusement. The recent government emphasis on the arts through the establishment of a National Endowment for the Arts amply demonstrates the recognition that we are in a society of expanding free time and that the arts are increasingly becoming important to the happiness and well-being of the people. Our future educational system will have to provide adequate programs which would stimulate interest in all forms of arts and develop skills needed to create beauty through the arts. Of course, arts are not the only way in which leisure can be effectively used. There are many alternatives. Sports,

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[1/] Office of Business Economics, U.S. Department of Commerce, The National Income and Product Accounts of the United States, 1929-1965 Statistical Tables. Washington, D.C.: Government Printing Office, August 1966. pp. 46-7. Consumer expenditures on recreation include diverse items such as books and magazines, radio and TV sets, sports equipment, musical instruments, toys, admissions to theaters and spectator sports.

travel, and the life of nature, for instance, are some of the other means to creative and effective use of nonworking hours. For the future we may also have to develop new forms of constructive activity in order to take full advantage of our growing opportunities for choosing the ways we spend our free time.

Increasing leisure time coupled with growing affluence in the coming decades would present the most difficult challenge to education for a meaningful life. Schools may have to provide a variety of educational programs and activities to prepare the ground for the creative uses of leisure. Year-round use of school facilities would be essential to meet the growing need for recreational facilities for working youths and adults. Such use of school facilities may also be needed to serve as community centers and to accommodate a variety of cultural and civic activities related to the improvements of the quality of life. The role of the educational system is thus to increase the range and skill of participation in congenial and rewarding leisure time activities.

5. Problems of Urban Centers and the Poor

The steady growth of the population in the United States over the past half century has changed the quality of American life. The predominantly rural character of this nation before World War I has been replaced by an increasingly urbanized society. The urban population, however, has been growing more rapidly at the periphery than in the central area. There has been a continuous exodus of people from the decaying neighborhood of the central city to the outskirts of the metropolitan community.

Every responsible projection indicates that the trend toward urbanization would continue for some time to come with most of the increase in population taking place in the outer reaches of the metropolitan area. It has been estimated that the proportion of the nation's population living in metropolitan areas will rise to about 73 percent by the mid-1970's, compared with 66 percent in the early 1960's.[1] In the past many of those who sought their future in the cities were nonwhites, primarily Negroes. Today, nearly 70 percent of the Negro population lives in metropolitan areas, largely concentrated in the central cities.[2] And they accounted for 20 percent of the total population of central cities in metropolitan areas, compared with only 12 percent in 1950. If this trend continues over the coming decade, over a quarter of the entire population in the central cities will be made up of Negroes by the mid-1970's.

The problems of urban centers and of slum dwellers will increasingly become the focal point of America's domestic issues in the coming decades. We will be faced with increasing traffic congestion, water shortages, air and water pollution, inadequate housing, deficiencies in education and health care, lack of jobs, and shortages of recreational areas and facilities. Comprehensive planning as well as adequate investment will be required to do what needs to be done in the area of urban development. A recent announcement by the U.S. Department of Housing and Urban Development of the 36 cities selected to receive Model Cities planning grants is certainly an indication of a growing awareness that urban needs and problems call for a coordinated national effort involving all levels of government and neighborhood residents, business, and organized labor.

1/ Joe Won Lee, "The Dimensions of U.S. Metropolitan Change: Projections to 1975 for 224 Areas," Looking Ahead, June 1967.

2/ U.S. Bureau of Labor Statistics and U.S. Bureau of the Census, Social and Economic Conditions of Negroes in the United States, Washington, D.C.: October 1967. p. 9.

Residential segregation within the metropolitan areas in the past has resulted in discrimination in employment and education. As has been clearly pointed out by the National Advisory Commission on Civil Disorders in its recent report, pervasive segregation and discrimination in education, employment, and housing have been the main sources of discontent, frustration, and unrest causing various acts of crime and street riots. In urban ghetto areas, according to a recent survey by the U.S. Department of Labor,[1] about one out of every ten residents were unemployed in 1966, a jobless rate three times the national average. In addition, almost 7 percent of those with jobs in slum areas were employed only part-time, although they wanted full-time work, and 20 percent of those with full-time jobs earned less than $60 a week. In cities where riots took place during 1967, according to the National Advisory Commission on Civil Disorders, Negroes were three times as likely as whites to hold unskilled jobs, which are often part-time, seasonal, low-paying and "dead end."[2]

Providing jobs for the unemployed is thus the first essential for assisting ghetto residents to lift themselves out of poverty and deprivation, and bringing an end to the slum conditions. Coping with the problems of the urban slums was a major consideration in President Johnson's request in his 1968 State of the Union Message for an expanded model cities program aimed at overcoming deficiencies in housing, jobs, child health care, and other areas. Establishment of a major industry-government cooperative program to train and provide jobs in the private sector for the hard-core unemployed in the nation's ghettoes provides a hopeful sign that the business community is also becoming more responsive to the problems of modern urban crises. Effective programs for transforming the inner-city, unskilled unemployed into productive wage earners will require well planned coordination of the community's resources for training, education, and social service to reach individuals currently at the margin of society.

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[1] Manpower Report of the President, April 1967. Washington, D.C.: U.S. Government Printing Office, 1967. p. 74.

[2] The Washington Post, March 1, 1968.

The urbanization accompanied by the movement of the middle class population and of economic activities to the suburbs represents one of the most serious educational challenges facing American schools. The existing imbalance in educational opportunities between the wealthy suburban areas and the city slums is too obvious a challenge to the concept of equality of opportunity. The exodus of middle- and upper-income families and of industry to the suburban areas in the past has resulted in a considerably lower tax base of the inner cities, when the demands on their financial resources for educational and other services are mounting. On the other hand, revenue sources of the suburban areas have been rising at a rapid rate. In the Baltimore metropolitan area, for instance, suburban taxable property value per capita increased from 81 percent of the central city level in 1950 to 110 percent of the central city level in 1960.[1] As a result of the dispersion of wealth to the suburbia, suburban school districts are often in a much better position to pay for various educational inputs including school facilities and teachers, and the subsequent better quality of education. Schools in the city slum areas, however, are often staffed by the substandard teachers and most of the school buildings are overcrowded and seriously dilapidated. Family and community environments in the ghetto neighborhoods offer our youth very little incentive to stay in school. As a result, there has been a growing disparity between the quality of educational programs provided to pupils from low-income families in inner cities and those from middle- and upper income groups in the suburbs. It was reported that the expenditure per pupil in wealthy suburban schools was as high as $1,000 per year, compared with less than half that amount in some big city schools.[1/] To innovate and provide educational programs which would remedy the years of substandard education offered ghetto children and to realistically meet the growing needs of future urban centers are some of the critical tasks facing our educational system in the coming decades. The federal government, through various financial arrangements such as revenue-sharing programs, will have to make available to the states and local school districts funds to encourage and implement these programs.

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[1] Joint Economic Committee of the Congress, Urban America: Goals and Problems, Hearing before the Subcommittee on Urban Affairs, Washington, D.C.: Government Printing Office, 1967. p. 158.

6. Achievement of National Goals and Shortage of Resources

Concern with the goals is deep-seated in our individual and social life. All of us, as individuals, set our own goals and seek to reach them throughout our lifetime. As a nation, we are dedicated to the promotion both of economic stability and growth as goals of our society, as exemplified in the Employment Act of 1946. We have lately become very conscious of deficiencies in education, health, and slum rehabilitation, and of what needs to be done to remedy these deficiencies. Concern with the high and rising cost of national objectives has been expressed by many private and public groups. President Johnson's call for a National Conference on Medical Costs in 1967, for instance, grew out of the concern that rapidly

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1/ Maurine Hoffman and Gerald Grant, "Inferior Schools Blight Education in Urban Slums and Rural Squalor," The Washington Post. January 6, 1965. While the level of expenditure per student may not be a perfect measure of educational quality, it is widely used as a rough approximation.

rising medical costs may deter the achievement of our health objective in providing quality medical services to all people at costs that are not beyond reach.

President Eisenhower's Commission on National Goals reflected this growing concern with the goals in its report in the early 1960's.[1] The report examined a series of national goals for vital areas of American life, and developed a broad outline of programs needed to achieve these goals. The goals considered were significant because they represented a broad consensus of opinion in defining the areas in our national life where improvements are needed. The first serious attempt to quantify the costs of these various national goals has been undertaken by the Center for Priority Analsyis of the National Planning Association.[2] Estimates of dollar costs of sixteen goal areas for 1962 and 1975 are listed in Table 2.

The major conclusion of the study is that all of the sixteen goals cannot be simultaneously achieved in the period of over a decade with available resources. To realize all these goals listed in Table 2, even after allowing for the ways in which the pursuit of one goal may contribute to the achievement of others, would require a total cost in 1975 of about $1,160 billion or about 15 percent more than the projected GNP level of of over $1 trillion that is likely to become available. It is quite obvious that affluent as the United States is, its resources are not without limit. It becomes necessary to choose what comes first. The problem of choosing priorities and of an efficient allocation of resources to achieve them is going to be the prominent issue in the coming decades.

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[1] Goals for Americans: Programs for Action in the Sixties, Report of the President's Commission on National Goals, Prentice-Hall, Inc., 1960.

[2] Leonard A. Lecht, Goals, Priorities, and Dollars: The Next Decade, New York, The Free Press, 1966. p. 365.

TABLE 2

Expenditures for Individual Goals, 1962 and Projected 1975
(in millions of 1964 dollars)

	1962		Projected 1975[a]		Percent Increase, 1962-1975
Goal Area	Amount	Rank	Amount	Rank	
Agriculture	$ 7,300	11	$ 9,300	14	27%
Area Redevelopment	400	15	1,000	16	150
Consumer Expenditures	364,800	1	674,400	1	85
Education	31,200	8	86,000	6	176
Health	34,000	7	89,800	5	164
Housing	30,900	9	65,000	9	110
International Aid	5,500	13	12,500	12	127
Manpower Retraining	100	16	3,100	15	3,000
National Defense	53,800	3	70,700	8	31
Natural Resources	6,000	12	17,100	11	185
Private Plant and Equipment	50,100	4	155,000	2	209
Research and Development	17,300	10	40,000	10	131
Social Welfare	39,100	5	94,400	4	141
Space	3,400	14	9,500	13	179
Transportation	35,900	6	76,600	7	113
Urban Development	67,700	2	136,700	3	102
Gross Total	$747,400		$1,541,100		106
Minus Double Counting and Transfer Adjustments b/	174,100		379,600		
Net Cost of Goals	573,300		1,161,600		

Source: Leonard A. Lecht, Goals, Priorities, and Dollars: The Next Decade. New York: The Free Press, 1966. p. 36. The estimates in this source are in 1962 dollars. They are expressed in 1964 dollars in this table.

[a] Refers to the estimated expenditures for the "aspiration goals" (that is, for achieving the standards) in 1975.

b/ The adjustment for double counting occurs because parts of the cost of some goals are also parts of the cost of other goals. Spending by families for tuition in colleges and universities is included as part of the total expenditures for the consumer expenditures goal. It also makes up part of the spending listed for the education goal.

The pursuit of our objectives in education[1] indicates some changes in the nation's priorities favoring a greater emphasis on education. To achieve our goals in education over the next decade is projected to require annual expenditures for public and private education in the magnitude of $86 billion in 1975 as compared with over $31 billion in 1962. This represents an increase of 176 percent over a 13-year period. Education is expected to move up from eighth place in our priorities list in 1962 to sixth place by the mid-1970's.

The future success of our efforts to achieve national goals in education will depend on the availability of resources which our economy would generate. But it will also depend, to a large extent, on the competing claims for the same resources arising from the pursuit of other goals in the public and private sectors of our society, such as national defense, health, and industrial plant and equipment. In this framework, the task of policy decision-making is "to reconcile these claims, and to keep a multitude of competing claims within the constraints set by the available or the anticipated resources."[2] The task of the future, then, is to develop a meaningful process for making optimum decisions in the private and public sectors which can result in wise choices in a democratic society. A technique known as PPBS[3] (planning, programing, and budgeting system), being widely utilized by various agencies of government, is designed to perform such a task of making the necessary compromises among various objectives in the public sector of our society. Further improvement in the coming years of this system to focus more on the relationship between the government agency goals and national goals would certainly help sharpen intuition and judgment in making effective decisions in the allocation of resources.

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[1] Goals for education underlying this estimate include the increase in the proportion of students from eligible age groups receiving high school and higher education, the increases in the ratio of professional staff to students, increases in teachers' salaries, the expansion of adult education and vocational training role of junior colleges, and the needed construction of school plants and facilities.

[2] Leonard A. Lecht, "Strategic Variables in Planning," in Planning and Effecting Needed Changes in Education, Edited by Edgar L. Morphet and Charles O. Ryan. Denver: Designing Education for the Future, 1967. p. 8.

[3] See David Novick, Editor, Program Budgeting: Program Analysis and the Federal Budget. Cambridge, Mass.: Harvard University Press, 1965. p. 382. For the application of PPBS to education, see Chapter 7.

III. POPULATION

The rate of growth of population is affected by a variety of social and economic conditions prevailing in our society. But the change in the level and composition of the population also affects the nation's ability to produce. The growth of our economy in the past has owed much to vigorous increases in the quantity and quality of our population. The availability of an increasing stock of educated and skilled human resources, coupled with the rising needs and aspirations of our working population, has contributed significantly to the expansion of our national wealth.

Future population growth, projected to increase by 72.5 million[1/] (or 38 percent) over the period 1964-1985, will undoubtedly provide an important stimulus to further economic growth. The projected rate of increase of 1.5 percent per year slightly exceeds the pace recorded during the past 36 years (1.3 percent), but is not expected to equal the rate experienced during the post-war period between 1948 and 1965 (1.7 percent). Growth in sheer size of the population, however, tells only part of the story. Just as important is the internal composition of the expected

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[1/] Projected population estimates used in this study are consistent with the U.S. Census Bureau's Series B projection of the population to 1975 and 1985.

change. Over the next two decades, the female component of our population will continue to grow at a somewhat more rapid pace than the male population. The nonwhite population is also expected to grow much faster than the white population.

1. Age Composition of Total Population

The different rates of growth in the various age groups of the population have significant implications for enrollment growth, teacher supply, school facilities, and ability of taxpayers to meet the rising costs of education. Data on changes in the school age population are of considerable importance in planning educational programs. Table 3 shows a projection of the number of persons in selected age categories (5-13, 14-17, and 18-24), roughly representing the elementary, high school, and college ages, respectively, for 1964 and projected years 1975 and 1985.

Because of the uncertainty surrounding the direction of future fertility, it is not clear whether the proportion of pre-college school age population will rise or fall over the next two decades. The projection of the Census Bureau,[1] however, indicates that its share (age 5-17) in the total population will decline from about 26 percent in 1964 to less than 24 percent by 1975, although the absolute number will rise by about 4 million over the period. Between 1975 and 1985, the pace of growth will be relatively faster, the proportion rising to nearly 25 percent. The slowdown in the rate of increase of these population groups, however, should not be interpreted to mean less needs forthcoming for school facilities, teachers, and other resources for the school programs aimed at these age groups. Migration, remedial education for the disadvantaged,

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[1] Refers to Series B projection.

TABLE 3

Estimates of School-Age Population, by Age and Color, 1964 and Projected 1975 and 1985 (number in millions)

	1964		Projected 1975[a]		Projected 1985[a]	
	No.	Percent of Total Population	No.	Percent of Total Population	No.	Percent of Total Population
TOTAL						
All ages	192.1	100.0%	223.8	100.0%	264.6	100.0%
5 to 13 Yrs.	35.3	18.4	36.6	16.4	48.1	18.2
14 to 17 Yrs.	14.2	7.4	16.9	7.6	17.4	6.6
18 to 24 Yrs.	18.7	9.7	27.5	12.3	28.8	10.9
WHITE						
All ages	169.4	100.0	195.1	100.0	227.8	100.0
5 to 13 Yrs.	30.3	17.9	30.7	15.7	40.0	17.6
14 to 17 Yrs.	12.4	7.3	14.4	7.4	14.6	6.4
18 to 24 Yrs.	16.4	9.7	23.7	12.1	24.3	10.7
NONWHITE						
All ages	22.7	100.0	28.7	100.0	36.8	100.0
5 to 13 Yrs.	5.0	22.0	5.9	20.6	8.2	22.3
14 to 17 Yrs.	1.8	7.9	2.5	8.7	2.8	7.6
18 to 24 Yrs.	2.3	10.1	3.8	13.2	4.5	12.2

[a] Estimates for 1975 and 1985 refer to Series B Projection of the Bureau of the Census.

and expanded vocational programs, motivated by the need for added training and skills in the future technological society, can be expected to accelerate the demand for added educational facilities in many communities.

A substantial increase in the population of 18-24 age group is expected throughout the 1970's but the rate of growth will slow down slightly thereafter. Nearly 28 percent of the total population growth from 1964 to 1975 will be concentrated in this age group, which will comprise over 12 percent of the total population by the mid-1970's, compared with less than 10 percent in 1964. The proportion is expected to decline to nearly 11 percent by 1985. For the period 1964-1985 as a whole, the population in this age group will increase by 54 percent as contrasted with only 38 percent for the total population. This group includes college age population, the young married couples, and the group seeking first jobs and starting new careers. With rapidly rising population, coupled with an increase in enrollment ratio, far more young people would be attending colleges and universities in the coming decades. Rising enrollment, larger faculties and other staffs, and existing backlogs and replacement needs imply considerable increases in expenditures for facilities.

The population in the prime working years 25-64 is expected to grow from 85.3 million in 1964 to 97.2 million in 1975 and to over 115 million by 1985. The increase projected for the entire period is almost 30 million, or about 35 percent. The younger segment of this group (25-44) will probably grow at a moderate pace through 1975, reaching 54 million -- an increase of only 15 percent over 1964. Thereafter, however, the number in this group will rise quite rapidly, rising to over 72 million by

1985. The older portion of this prime working age group (45-64) will grow only moderately through 1975, but is expected to decline slightly thereafter. Finally, the number of persons aged 65 and over is expected to grow at a slightly faster rate than the rise in total population, adding another 7 million (about 40 percent) between 1964 and 1985. As leisure time increases in the future, a greater number of retired persons might be expected to return to schools for continued education, whether for a degree, a skill or for culture.

2. Nonwhite Population

The projection shows that the nonwhite population will grow much faster than the white population. Between 1964 and 1985, the nonwhite population is expected to rise by 63 percent as compared with only 34 percent for the white. The proportion of nonwhites in the total population of all ages is likely to increase from 11.8 percent in 1964 to about 14 percent by the mid-1980's. The projected changes represent a continuation of the white-nonwhite differences in growth rates experienced over the past two decades.

The growth differentials are particularly marked for the school age population. For the elementary school age group (5-13) and the college age group (18-24), the nonwhite population is projected to increase twice as rapidly as the white population in the corresponding age group over the next two decades. For the high school age group (14-17), the difference in rates of growth is even greater -- 57 percent compared with only 17 percent. The nonwhite population will have relatively more young people than the white population. About 37 percent of the nonwhite population will be under the age 14 in 1985, compared with only 29 percent for the white.

The significance of these differences between white and nonwhite age structure, with important implications for public policies in education and other social programs, is shown more clearly by considering the dependency ratio, that is, the proportion of persons below and above working age in relation to persons of working age, 18 to 64 years. The ratio for the nonwhite population is expected to be about 101 in 1985, compared with only 82 for the white population. Thus the nonwhite population will have a considerably greater dependency burden than whites.

3. Geographic Mobility and Population Growth in the Metropolitan Areas

The rapid growth of the population during the past two decades was not evenly distributed throughout the country; there were some areas with very rapid gain and areas with substantial losses of population. Americans are well-known as a mobile and restless people in pursuit of new economic opportunities and better places to live. Each year since 1960, one person in every five has moved from one house to another, including moves from the farm to the city, from the city to the suburbs, and from one part of the country to another. And it is not surprising that the mobility rate for the nonwhite population is considerably higher than that for the white population, 23 percent as compared with only 19 percent.1/

1/ U.S. Bureau of the Census, Mobility of the Population of the United States, March 1965 to March 1966, Current Population Reports, Series P-20, No. 156, December 9, 1966. p. 9.

One of the most remarkable changes in our patterns of living, however, has been the movement away from rural areas in the South to urban, and especially industrial areas in the North and West. Within the metropolitan areas, slightly over half of the population lived in the central cities in 1960. But 90 percent of the population growth in metropolitan areas since 1960 has been registered in the suburban areas.[1/]

The trend toward urbanization is expected to continue with most of the growth in population over the next two decades taking place outside of thecentral cities. A recent study by the National Planning Association shows that by 1975 about 73 percent of the U. S. population will be living in metropolitan areas, 60 percent of whom will be concentrated in the 25 largest metropolitan areas.[2/] If this trend continues beyond 1975, the proportion of the nation's population residing in metropolitan areas will rise to close to 80 percent by the mid-1980's, with four-sixths of them living in areas outside the central cities. Many of those who will seek their future in the metropolitan areas will be nonwhites, largely Negroes. Negroes constitute a majority of the central city population in only one of the ten largest cities in the United States -- Washington, D.C. However, they made up more than a third of the total population in each of four other cities in 1965, Detroit, Baltimore, Cleveland, and St. Louis.[3/] The continuation of the present trend toward Negro concentration in cities would give seven of America's ten largest cities a

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[1/] U.S. Bureau of the Census, Statistical Abstract of the United States, 1967. (88th Edition). Washington, D.C., 1967. p. 21.

[2/] Joe Won Lee, "The Dimensions of U.S. Metropolitan Change: Projections to 1975 for 224 Areas," Looking Ahead, June 1967.

[3/] U.S. Bureau of Labor Statistics and U.S. Bureau of the Census, Social and Economic Conditions of Negroes in the United States, Washington, D.C.: October 1967. p. 11.

Negro majority by 1985. Communities in the metropolitan areas that must absorb large numbers of people of different educational and social background will experience many of the problems, some of which already plague our large cities. Anticipated rapid growth of population in central cities will undoubtedly intensify the problems of congestion, pollution, housing, education, job training and employment, and transportation.

IV. LABOR FORCE AND LABOR PARTICIPATION RATE

The total labor force is projected to increase by over 31 million, between 1964 and 1985, to 108 million. The number of male workers is expected to rise by 18.4 million or 36 percent as compared with 12.7 million (nearly 50 percent) for females. The relative increase in the number of nonwhite work force will be much greater than that of the white workers. They are expected to grow by 63 percent from 8.5 million in 1964 to nearly 14.0 million by 1985; the number of white labor force, on the other hand, would rise by only 38 percent from 68.5 million to 94.2 million over the same period. This difference in rates of increase between white and nonwhite workers is primarily due to the anticipated faster rate of population growth among nonwhite young people. Changing social and economic conditions anticipated over the coming two decades will also affect the nonwhite labor force participation rates significantly and thus reduce the gap between white and nonwhite participation rates. Table 4 presents the total labor force and participation rates for 1964 and 1985 broken down by each sex-age group. Estimates of white-nonwhite labor force and respective labor participation rates are shown in Appendix Table.

1/ Labor participation rates refer to the proportion of the population at least 14 years old who are in the labor force. The U.S. Department of Labor recently changed the definition of the labor force to exclude persons who are less than 16 years old. To maintain consistancy between the projections and the historical data, the old definition--14 years of age and over--has been used.

TABLE 4

Total Labor Force and Labor Participation Rates by Age and Sex 1964 and Projected 1985

Sex and Age Group	Total Labor Force			Labor Participation Rates	
	Number in Millions		Percent Change,		
	1964	Projected 1985	1964-85	1964	Projected 1985
TOTAL					
14 Yrs. and over	77.0	108.1	40%	56.5%	58.1%
14 - 24 Yrs.	16.0	23.9	49	48.5	51.7
25 - 34 Yrs.	14.8	27.8	88	66.4	68.2
35 - 44 Yrs.	17.2	22.9	33	69.9	73.1
45 - 54 Yrs.	15.7	16.6	6	72.3	76.5
55 Yrs. and over	13.3	16.9	27	38.6	36.6
MALE					
14 Yrs. and over	51.1	69.5	36	77.2	77.2
14 - 24 Yrs.	10.0	14.8	48	59.9	63.0
25 - 34 Yrs.	10.6	19.6	85	96.1	96.0
35 - 44 Yrs.	11.6	15.0	29	96.2	96.3
45 - 54 Yrs.	10.0	10.0	--	94.5	94.8
55 Yrs. and over	8.9	10.1	14	56.0	50.5
FEMALE					
14 Yrs. and over	25.9	38.6	49	37.0	40.1
14 - 24 Yrs.	6.0	9.1	52	36.8	40.1
25 - 34 Yrs.	4.2	8.2	95	37.1	40.5
35 - 44 Yrs.	5.6	7.9	41	44.8	50.4
45 - 54 Yrs.	5.7	6.6	16	51.0	59.7
55 Yrs. and over	4.4	6.8	55	23.5	26.0

Note:
Projected estimates for 1975 are presented in Appendix Table 3.

The size of the labor force is determined by the labor participation rate as well as the size of the population. Various socizl and economic factors [1] interact in such a way that the overall labor participation rate tends to show fair degree of stability over the long run, although rates for certain age-sex segments may change over a period of time. We expect the broad characteristics of these participation rates to continue through the 1980's. However, we make a specific assumption that the practice of sabbatical leaves now largely confined to few industries would expend in the next two decades to include many more persons in the workforce. In addition, our projections assume a rising rate of earlier retirements and increased school attendance by persons in their late teens and early twenties, thus lowering the labor particication rates of both the young and old. Taking these factors into consideration, the overall labor participation rate is projected to increase only moderately from 56.5 percent in 1964 to 58 percent by 1985. This increase in the rate of labor participation would result primarily from the female segments of our population who are expected to expand their economic activities by seeking work in full-time and, increasingly, in part-time employment. The labor participation rate for women will rise from 37 percent in 1964 to over 40 percent by 1985. Men, however, are not expected to change their overall patterns of labor force participation, remaining at about 77 percent over the next two decades.

The most dramatic change expected over the next two decades is the vast increase in the number of persons in the work force from the younger age group 25-34. The net addition of 13.0 million workers, an increase of 88 percent, reflects the sharp increase in the population and the slight increase in the labor participation rates for these groups. Over two-third of the projected growth in the entire labor force between 1964 and 1985 (21 million out of 31 million) will occur among workers 14-34 years old. See Table 4.

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[1] Labor participation rates depend on a number of factors such as husband's income, overall economic activity, extent of urbanization of population, availability of pensions and retirement practices, school of enrollment patterns, and number and age of children in the family. See, for instance, Gertrude Bancroft, The American Labor Force, Census Monograph Series, New York: John Wiley and Sons, Inc. 1958. p. 28.

Between 1964 and 1985 the number of young nonwhite workers (14 to 24 years) is expected to grow at the rate more than twice the rate of increase of their white counterparts. Their number is projected to nearly double over the 21-year period, while that of young white workers will rise by less than half. These differences in the growth rate between white and nonwhite workers may result from projected differences in the rate of population growth as well as differing patterns of work activity between them. The labor participation rates of nonwhite teenagers have been considerably lower than those of white youngsters in recent years. Part of these low rates may have resulted from their failure of securing suitable jobs in the labor market. Continuous efforts to provide equal opportunity in employment are likely to have favorable effects on the job prospects for these nonwhite teenagers, and thus improve their economic activity in the years ahead.

The number of women workers at prime working age (25-54) is expected to rise by 7.2 million or 47 percent in the next two decades. The increase will be particularly large among women 25 to 34 years of age, with a gain of 4 million representing a 95 percent rise.

Over the years the labor participation rates of nonwhite working women (25-54) have been considerably higher than those of white women in the corresponding age group. This high rate of participation for nonwhite women largely reflects the low level of income and high unemployment rate of nonwhite men. It is expected that labor participation rates of these two groups will tend to converge over the next two decades. The projection indicates that the participation rate of white women 45 to 54 years of age will rise from about 50 percent to 59 percent between 1964 and 1985, as compared with a rise from 62 percent to over 64 percent for nonwhite women. One important factor underlying this assumption of convergence is that the anticipated improvement in employment opportunities for nonwhite men will substantially raise the economic status of nonwhite population, and thus some of the economic reasons for the nonwhite women's high propensity to work will diminish in importance in the next two decades.

Nonwhite men in this age group (25-54), on the other hand, are expected to increase their labor participation, with their rates gradually rising to come closer to the fairly stable rates for white workers by 1985. Elimination of discriminatory practices in employment, rising educational attainment, and expanded job training programs will all contribute toward rising labor participation for nonwhite workers. The number of nonwhite workers 25 to 54 years old will rise by two-thirds over the next two decades, contrasted with an increase by a third among white men in this age group. Male workers in the prime working age (25-54), however, will continue to be the most stable element in the entire work force, accounting for roughly 40 percent in both 1964 and 1985.

The number of older workers (55 years and over) is projected to rise from 13.3 million in 1964 to close to 17 million by the mid-1980's. However, in terms of the proporation in the total labor force, it is expected to decline slightly from over 17 percent to less that 16 percent. This slight decline reflects the anticipation that more widespread coverage and improved benefit payments from social security and other private retirement programs may speed up the rate of retirement at the age even less than 65 years.

V. OUTPUT, PRODUCTIVITY, AND EMPLOYMENT

The most important determinants of any manpower projection are the basic assumptions describing the expected level and structure of the economy anticipated in the target year. Specific assumptions have to be made as to the size of the labor force and the armed forces, the level of unemployment, annual hours of work, and productivity.

Looking toward the future two decades from now, one of the great uncertainties facing the nation is the precise impact scientific and technological developments will have upon the nation's economy. Productivity measurement, particularly output per manhour, closely reflects the rate of technological change, although education and training of workers, business management, and capital investment, are also involved.

To provide an indication of the implications of more or less rapid technological change for employment needs and the occupational composition of employment, two alternative sets of projections are prepared for manpower requirements in the mid-1980's. One projection assumes an overall increase in GNP per man-hour of about 3 percent per annum, roughly consistent with the average annual increase experienced during the post-war period (1948-1965). The other projects an average annual productivity growth similar to the maximum increase in GNP per man-hour the economy sustained, on an annual average basis, for several consecutive years at a time in the past generation, an increase of nearly 3.6 percent a year.[1] These projected rates of increase serve to illustrate differentials in manpower impacts and they do not represent "high" and "low" estimates of the probable changes in productivity in the future.

Between 1964 and 1985 the total volume of output is projected to rise in 1964 prices from $630 billion to about $1.5 trillion for the economy based on the moderate rate of productivity growth (3.0 percent per year). Assuming a higher rate of productivity growth of about 3.6 percent a year, the level of output would rise to over $1.6 trillion. These projections imply an average annual growth in total output of about 4.3 percent and 4.7 percent, respectively. The projected increase in output will be obtained by increased efficiency in resource use as well as increased utilization of resources. Table 5 shows the contribution to the annual GNP growth rate to be made by two important factors, i.e., labor input (man-hours) and productivity (output per man-hour). As is evident, the anticipated gain in the gross national product will result primarily from increases in output per man-hour rather than in employment or man-hours.

1/ See National Planning Association, National Economic Projections to 1976/77, NEPS Report No. 66-N-1. p. 49.

TABLE 5

Factors in GNP Growth

Growth Factors	Average Annual Growth Rate 1948-1965	1964-1985 Moderate Productivity Growth	1964-1985 Rapid Productivity Growth
1. Manhours	0.9	1.3	1.0
1) Employment	1.2	1.7	1.6
2) Average weekly hours	-0.4	-0.4	-0.6
2. GNP per man-hour	2.9	3.0	3.6
GNP	3.8	4.3	4.7

The projection of total output of goods and services, viewed from the supply side, involves the projections of the total number of persons working, the total number of man-hours worked, and the average output per man-hour. Thus, the GNP is the product of these three major components.

Since the future supply of the labor force is closely related to the growth of the population, it is first necessary to estimate the size of the future population as well as its distribution by appropriate age, sex, and color groups. The projection shows that the total population will reach 265 million persons by the mid-1980's. Of this total about 70 percent or about 186 million will be in the age group 14 years and over which becomes the source of the future labor supply.[1]

The size of the labor force will be determined not only by the number of persons in each age group, but also by the labor participation rates in each age, sex, and color group. The projected size of the labor force thus reflects the labor participation rates of future population groups differentiated by age, sex, and color. The overall labor participation rate is expected to increase from about 56.5 percent in 1964 to 58.0 percent for the modraate productivity growth estimate and to 57.3 percent for the higher productivity growth estimate.[2] The projected size of the labor force indicates an increase between 1964 and 1985 from about 77 million to 103 million for the moderate productivity growth alternative. If the technology advances at a much faster pace than currently anticipated, the impact of rapidly rising productivity, i.e., 3.6 percent a year, would probably slow down the increase in the labor force by inducing earlier retirement, lower participation by certain age groups, or reduced hours of work. Two alternative sets of projections show a difference in the labor force of about 1.3 million in the mid-1980's.

Given the total labor force projections, we then estimate employment by determining the size of the armed forces and a future unemployment rate. The size of the armed forces in the mid-1980's is assumed to remain at the level that existed immediately prior to the Vietnam buildup, i.e., about 2.7 million. This assumption provides the size of the civilian labor force in 1985 at 105.3 million for the estimate based on a moderate increase in productivity and 103.9 million for the higher productivity growth estimate.

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[1] Beginning January 1967, the U.S. Department of Labor changed the definition of the labor force, raising the lower age limit for the inclusion of persons in labor force statistics from 14 years to 16 years of age. All of our projections in this study, however, are based on the labor force of 14 years of age and over.

[2] Primary sources for this projection are Sophia Cooper and Denis F. Johnston, "Labor Force Projections, by Color, 1970-80," Monthly Labor Review. September 1966, pp. 965-972, and National Planning Association, National Economic Projections to 1976/77, op. cit.

There has been much discussion regarding what would be the optimum level of unemployment. It has been suggested that the 4 percent unemployment rate be considered as an acceptable level which would yield approximate balance between the supply and the demand for labor.1/ In the light of technological developments and prospects for public policies affecting levels of total demand and manpower skills, we assumed in our projection that 96 percent of the civilian labor force will be employed in the mid-1980's for both sets of projections. If unemployment were to be reduced below the 4 percent level, the GNP generated by the additional workers would increase the output by more than the amount projected for 1985.2/

The projection of the total number of working hours is a complex task involving various factors, some of which we have already discussed, i.e., population, labor participation rates, unemployment rates. The average number of hours worked per week is another important factor underlying the projection of total man-hours. For the moderate productivity growth alternative, we have projected the decline in average weekly hours at about the same rate as in the post-war period of 1948-65 -- 0.4 percent

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1/ See Economic Report of the President, 1967, Washington, D.C.: January 1967. p. 42.

2/ If, for instance, unemployment could be reduced to 3 percent, over $15 billion would be added to GNP in 1985.

a year. This results in an average workweek of about 35.5 hours in the mid-1980's. Combining the average number of hours worked per year with the number of total employment in 1985, we find that the total man-hours worked in the economy will be about 191 billion. This is about 30 percent higher than the base year 1964 level, averaging an increase of about 1.3 percent per year over a period of twenty-one years. For the higher productivity growth estimate, we may expect that the overall workweek will decline at a more faster rate than the alternative estimate -- to about 34 hours by the mid-1980's. Total man-hours of employment under this assumption would amount to about 180 billion in 1985, representing a growth of 34.4 billion hours or about 24 percent over 1964.

The assumptions and data gathered to this point are now used to make a tentative estimate of the projected GNP. This overall GNP serves as a control total for further analysis and development of estimates of gross product originating (GPO) in each major industrial sector. The employment-GPO ratios, together with estimates of productivity changes by industry and the projected GPO in each industry in 1975 and 1985, forms the basis for our estimates of industry distribution of employment.1/ An analysis of shifting occupational patterns for different industry groups leads to a projection of the occupational distribution within each industry.

1/ For this approach to estimating industry employment, see National Planning Association, Revised Statistics of Output, Employment, and Productivity: U.S. Economy and Selected Industries, 1947-1985, NEPS Report No. 65-1. March 1965.

VI. NATION'S MANPOWER REQUIREMENTS IN THE NEXT TWO DECADES

Under the assumption of 3 percent annual growth in per man-hour productivity, the total civilian employment is expected to rise by 31 million from over 70 million in 1964 to 101 million by the mid-1980's. Total employment in the projection with the somewhat higher rate (3.6 percent) of productivity growth shows very little difference, only about 1 percent (or over 1.3 million) less than in the alternative estimate.

1. Projected Manpower Requirements in Major Industries

Accompanying the projected growth in the overall economic activity will be significant changes in the types of goods and services produced and in the productivity of each activity. As a result, all industries are not expected to share equally in this anticipated growth, and there will be some shifts in the industrial composition of employment. The introduction of new technology and the emergence of new products and of new industries would significantly affect the industrial distribution of employment.

Table 6 shows the growth in employment from 1964 to 1985 for broad industry sectors. Overall employment is projected to rise by 44 percent in the projection with the moderate rate of productivity and by 42 percent for the higher productivity growth estimate. As is evident from the table, service-producing industries as a whole are expected to have a much faster increase in employment than goods-producing industries as a whole. Manpower requirements in service industries will increase by well over half between 1964 and 1985, while in goods-producing industries the growth will amount to about a fourth. Growth in overall economic activity, the probable increases in family income and in leisure, and technological change are some of the important forces influencing prospects for rapid growth in service-related industries. Among occupations most likely to be affected are those closely identified with the health and medicare programs, i.e., doctors, dentists, nurses, medical technicians, and hospital attendants. Rapid growth is also projected for social workers, airplane pilots, and in occupations such as cooks, or waiters which will be in greater demand as leisure and family income increase. The schools of the future will need to give more attention to developing training programs oriented to the service occupations such as health, safety, recreation, education, and community services.

TABLE 6

Employment by Broad Industry Group,
1964 and Projected 1985
(number in thousands)

Industries	1964	Projected 1985 Moderate Productivity Growth	Projected 1985 Rapid Productivity Growth	% Change, 1964-85 Moderate Productivity Growth	% Change, 1964-85 Rapid Productivity Growth
Goods-Producing Industries	28,430	35,510	34,980	25%	23%
Manufacturing	18,490	23,990	23,840	30	29
Construction	4,510	7,990	7,660	77	70
Agriculture, Forestry & Fisheries	4,890	3,070	3,030	-37	-38
Mining	540	460	450	-15	-17
Service-Producing Industries	41,930	65,590	64,790	56	55
Service	16,850	27,930	27,750	66	65
Trade	13,480	19,610	19,380	46	44
Public Administration	3,690	6,970	6,940	89	88
Finance, Insurance & Real Estate	3,290	6,190	5,860	88	78
Transportation & Public Utilities	4,620	4,890	4,860	6	5
TOTAL	70,360	101,100	99,770	44	42

Employment requirements are expected to decline in two industries, i. e., agriculture and mining. Technological developments will continue to have an important impact on future manpower requirements in these industries. The rise in productivity, which characterized the long-term decline in farm employment, is expected to continue as a result of the increased use of much improved machines and equipment, better fertilizers, improved methods of animal feeding, and other technological advances. Use of electronic computers in a wide range of farm activities, such as accounting and cost control systems, will undoubtedly improve the efficiency of farm management. As a result, the overall manpower needs in the agricultural sector will decline by three-eighths from less than 5 million in 1964 to over 3 million by the mid-1980's.

Manpower requirements in mining are expected to decline slightly as a result of continued mechanization of production process in this industry. The level of employment will be reduced over the next two decades by about 100,000 from the 1964 level of half a million. The major decline is expected to take place in bituminous mining establishments, while in other areas, such as nonmetallic minerals mining, the need is expected to grow rapidly. While the overall effect of technological developments in mining is to reduce the number of unskilled and semi-skilled workers, it will increase the demand for workers with specialized training, such as geophysicists and metallurgists.

Manpower requirements in the construction industry will increase at a rate substantially higher than the average for goods-producing industries as a whole, three times as high. Stimulated by various public and private programs designed to overcome deficiencies in housing, hospitals, schools, urban renewal, and highways, the construction activity over the next two decades is expected to rise at a rate much above the average for aggregate economic activity in the nation. However, manpower needs are not expected to increase as fast as construction activity because the productivity will also rise at a rapid rate. The increasing use of labor-saving technological innovations, such as prefabrication of construction components and further mechanications of the work process and materials handling is expected to shift employment from building trades to factory operations. Among occupations likely to be adversely affected by these technological developments are operators, bricklayers, plumbers, plasters, painters, and carpenters.[1] Based on these and other factors, the overall employment requirements in the construction industry are projected to rise over the 1964-85 period from 4.5 million to 8 million and to 7.7 million for moderate and for higher productivity growth projections, respectively.

Manufacturing is the largest industry sector in the economy, employing 18.5 million workers and accounting for well over a fourth of all workers in 1964. However, future manpower requirements in manufacturing are expected to increase at a somewhat slower rate than those for the economy as a whole, about 30 percent vs. over 40 percent. By the mid-1980's, manufacturing manpower needs may amount to close to 24 million. Technological developments in manufacturing, such as increasing use of new and complex instruments and computers and the introduction of new products, will continue to have an important effect on both the number and occupational pattern of manufacturing employment, although all manufacturing industries will not be affected uniformly. For instance, employment reqlirements for skilled maintenance and repair workers needed for complex equipment will increase and needs for production workers could fall.

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[1] The Outlook for Technological Change and Employment, Appendix Volume I of the Report of the National Commission on Technology, Automation, and Economic Progress. Washington, D. C.: February 1966, pp. I-27.

Manpower requirements in government administration (Federal-state-local) are expected to grow at a rate of about 3 percent a year from about 3.7 million in 1964 to 7 million by the mid-1980's. This implies an increase of nearly 90 percent over the twenty-one-year period, more than twice the rate of growth anticipated for total employment requirements. Most of this increase, however, will be in state and local governments. Anticipated increases in population and income, greater demand for educational services and a continuing trend toward urbanization will intensify the demand for services traditionally furnished by state and local agencies, such as education, health, sanitation, welfare, and fire and police protection. Currently state and local government employment is over three times as great as Federal employment, and it is projected to grow at an average annual rate of 4 percent over the next decade.[1] Technological developments may be expected to moderate manpower needs in government services. Although the demand for routine clerical-type workers will diminish considerably, the increasing use of automatic data processing equipment and computers in scientific research and other more sophisticated purposes is expected to result in an increased need for a wide range of occupations, such as computer operators, machine monitors, management analysts, programmers, and engineers.

Manpower requirements in finance, insurance and real estate are expected to grow rapidly over the next two decades, reflecting the anticipated increase in the level of income and the expansion of complex financial activities of firms and individuals. Under the assumption of a moderate rate of productivity growth, employment requirements in this industry will rise from 3.3 million in 1964 to about 6.2 million by the mid-1980's. Rapid technological advances and a higher rate of productivity increase, however, will result in a somewhat reduced overall level of manpower requirements, 5.8 million in 1985. Major labor-saving innovations in the banking industry, such as greater use of computers and magnetic ink character recognition (MICR) are expected to reduce further the need for certain types of clerical employees. Increased applications of computers to more sophisticated management-oriented functions, on the other hand, will generate a need for more management and professional workers.

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[1] Bureau of Labor Statistics, Manpower in State and Local Governments, 1965 and 1975. Washington, D. C.: U. S. Department of Labor, December 30, 1966, pp. 3 and 5.

With growing affluence and greater leisure, consumers are expected to spend a larger proportion of their income and leisure time on services of various kinds -- health and educational services, professional services and recreation. As a result, manpower requirements in the service industry will grow at a rate much faster than those for the economy as a whole over the coming two decades. The number will rise from about 17 million in 1964 to nearly 28 million by 1985. Requirements in health and educational services may represent a greater share of this growth, as needs in these areas will grow at a rapid pace over the next two decades. Technological developments are not expected to have significant effects on the employment growth in this industry, because of the person-to-person nature of most of the services performed. The number of service occupations likely to be eliminated as a result of technological advances will be far fewer than the number of new workers required to meet the rising demand for services.[1]

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[1] The Outlook for Technological Change and Employment, op. cit., pp. I-112.

Manpower requirements in wholesale and retail trade establishments are expected to grow steadily over the next two decades, mainly to keep pace with increases in population and consumer expenditures. The rate of increase in requirements will be somewhat limited, however, by technological innovations, such as wider use of vending machines and other self-service devices and of computers for inventory control and billing, which will reduce the labor requirements per unit of output. The estimated requirements will rise from about 13.5 million in 1964 to less than 20 million by the mid-1980's. A large part of the increased employment in trade will be among part-time workers, particularly women and younger workers.

Technological advances will be a significant factor in limiting the growth of manpower requirements in transportation and public utilities industries. Requirements are expected to grow only slightly from 4.6 million in 1964 to 4.9 million by 1985. Although only a slight change is expected in the manpower needs, output originating in this industry sector is projected to continue to rise rapidly reflecting the expansion of population and general business activity. This fast growth in output, however, will be largely offset by rapid increases in productivity.

2. Projected Manpower Requirements and Changing Occupational Structure

Table 7 presents the estimated distribution of employment in 1964 and in 1985 for the two alternative projections. The largest increases will occur in professional and technical workers for both estimates, continuing the long-term historical trend. About 1 out of 8 civilians employed in 1964 was a professional or technical worker. By 1985, however, this ratio is expected to rise to 1 out of 6. Large percentage increases are also anticipated for the service workers, excepting private household workers. Employment for blue collar workers is expected to grow, but at a much slower rate than total employment. Among blue collar workers, employment for unskilled and semi-skilled operatives and laborers would grow least, by about one-half or less the overall percentage increase in employment. The number of farm workers is projected to decline by close to half over the two decades.

Table 7

Employment by Major Occupational Group
1964 and Projected 1985
(number in millions)

		Projected 1985		Percent Change, 1964-85	
Occupations	1964	Moderate Productivity Growth	Rapid Productivity Growth	Moderate Productivity Growth	Rapid Productivity Growth
White Collar Workers	31.1	50.9	50.5	64%	62%
Professional & Technical	8.6	15.9	16.9	85	97
Managers, Officials & Proprietors	7.5	10.9	10.6	45	41
Clerical and Sales	15.1	24.1	23.0	60	52
Blue Collar Workers	25.5	32.1	30.9	26	21
Craftsmen and Foremen	9.0	11.8	11.5	31	28
Operatives & Laborers	16.5	20.3	19.4	23	18
Service Workers	9.3	15.7	16.0	69	72
Private Household Workers	2.3	3.1	3.1	35	35
Other Service Workers	6.9	12.6	12.9	83	87
Farm Workers	4.4	2.5	2.4	-43	-46
TOTAL	70.4	101.1	99.8	44	42

Our projections of the overall level of employment under two alternative assumptions show only a small difference, about 1.5 percent. However, more rapid technological change would accentuate the increase in employment projected for service workers and for professional and technical workers, and especially for engineers, scientists, and technicians. Between 1964 and 1985, for instance, employment of all types of technicians with the higher rate of productivity growth is expected to increase at more than 70 percent the rate anticipated under the alternative projection. See Appendix Tables 6 and 7.

During the same period, requirements for engineers and scientists are expected to rise from about 1.2 million to 2.4 million for the moderate productivity growth and to over 2.7 million with the higher rate of productivity growth. Greatly increased requirements for scientists and engineers are anticipated not only to meet the needs generated by the normal growth of the economy, but also to channel more scientific and engineering talent into education, urban development, national defense, research and development, and programs of economic development of less developed countries. Other professional occupations for which personnel needs are expected to rise at an extremely rapid rate are: airplane pilots and navigators, college professors, librarians, social welfare and recreation workers, and health related occupations.

Manpower needs for managers, officials, and proprietors are expected to grow by about three-sevenths over the 1964-1985 period, rising from 7.5 million to less than 11 million. This relative increase in employment for the managers-proprietor group as a whole would be about the same as that for all occupations. However, the number of salaried managers and officials would continue to rise substantially over the next two decades. The growing size and complexity of modern business and governmental organizations will increasingly place heavy premium on well-trained management specialists. The number of proprietors, on the other hand, is expected to be at roughly the 1964 level over the next two decades.

Employment of clerical and sales workers is expected to show a relatively large expansion over the next two decades. Between 1964 and 1985, the number would rise from 15 million to over 24 million and to 23 million, respectively, for the moderate and higher productivity growth projections. Clerical and sales workers will comprise the largest group of all employed persons in 1985, accounting for over 23 percent. Clerical workers, however, are expected to have a much more rapid growth in employment than sales workers. Although technological innovations such as electronic computers, bookkeeping and calculating machines, and other labor-saving office equipment are expected to limit growth in certain clerical workers, new demands will be generated as a result of anticipated rapid expansion of the finance, insurance, and other industries employing many clerical workers. Increasing use of self-service techniques and vending machines will continue to replace retail sales workers in department stores and variety stores. However, over one million additional sales workers will still be required over the 1964-1985 period to meet the needs of a growing population with greater income.

Blue collar workers as a whole are expected to have a slower-than-average rate of employment growth in the next two decades, rising from

25.5 million in 1964 to 32 million in the mid-1980's for the moderate productivity growth projection. The greater automation and mechanization associated with rapid technological advance may reduce the needs for blue collar workers by one million from the alternative estimate in 1985.

The craftsmen and foremen will continue to grow more rapidly than the operatives and laborers as a whole. Increasing automation of production processes would have greater impact on semi-skilled and unskilled workers. Increased employment in mechanics and repairmen, foremen, and excavating, grading, and road machinery operators will account for most of the growth in the skilled occupations. Mechanics and repairmen will continue to have the most favorable employment prospect over the next two decades, as needs for skilled workers to install and maintain growing amount of complex machines rise rapidly. Building trades craftsmen, on the other hand, will be adversely affected by such technological developments as increases in the size and capacity of construction machinery, new and improved construction materials, and growing use of prefabricated building components.

Advancing technology will continue to limit employment requirements for laborers, and, to a lesser extent, for operatives. The increasing use of numerically controlled machines and the mechanization of production and assembly processes are expected to reduce unit labor requirements for operatives. As a result, the proportion of operatives and laborers in all civilians employed would decline from about 24 percent in 1964 to 20 percent by the mid-1980's. Nevertheless, their employment may increase by 3 to 4 million over the 1964-1985 period.

Employment of service workers including private household workers is expected to rise by about 70 percent between 1964 and 1985, to nearly 16 million. Service workers employed outside private homes, however, will increase much more rapidly. They are expected to grow over the twenty-one-year period by 81 percent for the moderate productivity growth estimate and by 86 percent in the projections assuming the more rapid growth in productivity. Higher incomes and greater leisure may be responsible for the larger increases in employment anticipated for many service occupations in the projections assuming the higher rate of productivity growth. These rates of growth of 81 percent and 86 percent will be exceeded only by professional, technical, and kindred workers. The greatest increase in employment requirements in the service occupations will be for hospital attendants, policemen, foremen, practical nurses, and waiters. The increase in population, especially in metropolitan areas, the growing demand for more and better medical care, and the more frequent visits to restaurants are some of the important factors likely to increase needs in these occupations.

3. Uses and Limitations of Manpower Projections

The need for, and usefulness of, long-range manpower projections are now universally recognized. An increasing number of countries, including many developing ones, are now regularly engaged in estimating manpower projections for use in developing a broad framework integrating economic planning, manpower planning and educational planning. Manpower policy is seen as a vital element in a rational policy of balanced economic and social development.

In the United States numerous public agencies including the U. S. Department of Labor, the U. S. Office of Education, and the National Science Foundation prepare projections of manpower needs and supply in various occupations as part of their planning perspective. The Inter-Agency Growth Project set-up in the Federal government in the early 1960's provided a unique contribution to the development of an integrated framework for evaluating long-range manpower problems in the United States. Manpower projections and planning also help many business corporations to meet their future labor requirements. Lately, increased attention is also being directed at the implications of scientific and technological advances for the provision of a labor force of appropriate size and with appropriate skills.

The manpower projections provide a useful means for facilitating the formulation of plans for the utilization and training of manpower, or for matching the supply of and demand for manpower. If the needs for particular types of occupations are going to exceed or fall short of the supply, it is quite important that this should be known well in advance, so that appropriate measures can be taken to cope with the situation. The anticipation of future needs and the preparation and proper guidance of people to areas of great demand would do much to alleviate the bottlenecks in the labor market that may develop in the process of economic growth. So far as shortages are concerned, special importance must be attached to the projections of highly skilled manpower, since programs to remedy shortages in these occupations may take years to implement. Manpower projections thus provide valuable information which will help determine how much the educational facilities and training programs must be expanded to meet the future requirements for trained manpower. The passage of the 1963 Higher Education Facilities Act largely grew out of the concern that a growing and expanding economy would require a larger supply of professional and technical workers.[1]

Manpower requirement projections serve useful purpose in the vocational counseling of youths in schools. Information on the future employment opportunities in various occupations and industries such as that contained in the Occupational Outlook Handbook helps them select and prepare their careers. The need to plan education and training programs in the light of information on future manpower requirements was well recognized in the Vocational Education Act of 1963. In this sense, the application of manpower requirement projections to educational planning or vocational guidance may be considered as an early warning system to adjust supply to changing demand.

These are some of the uses to which manpower projections can be put. However, it is equally important to recognize that these projections and their practical uses contain many problems and shortcomings. There are needs for more and improved data and further research which could help in developing more comprehensive manpower projections and in making them more useful.

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[1] Sar A. Levitan, Evaluation of Occupational Data and Their Use in Educational Planning. A paper presented before the Conference on Occupational Data Requirements for Education Planning, Center for Vocational and Technical Education, University of Wisconsin, June 16, 1965. p. 4.

Most of the existing manpower projections deal with employment requirements, the demand side of the labor market. Comparable supply projections are lacking for most occupational groups. Currently available manpower supply projections are largely in the selected professional and technical occupations such as teachers, engineers, scientists, medical professions, technicians, etc.[1] Projections of requirements and supply of specific groups of workers and the possible imbalance are intended to help make decisions by employers or by government with respect to these occupations. To develop useful supply projections for the broad range of occupations to serve this purpose, additional research may be needed to improve our understanding of the forces affecting occupational choice and mobility. More information is needed on death and retirement rates by occupations. Individual occupations are found to have different retirement patterns, and more comprehensive information on these retirement patterns would help in estimating attrition rates.[2] Further research is also needed regarding the effectiveness of educational and training programs and their relation to occupational choice. There should be more research on the question of the wage structure and its relationship to job mobility.

There is also a growing need for work on sub-national occupational projections. Most of the existing manpower projections refer to national estimates. However, many of the decisions regarding educational programs are made at state and local levels. Manpower projections would serve a more meaningful purpose if they can indicate the anticipated occupational requirements within a state or a locality. A recent study undertaken by the Battelle Memorial Institute[1] for the State of Michigan, for instance, illustrates an effort in this direction.

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[1] Center for Priority Analysis of the National Planning Association recently completed supply-demand projections for 30-odd occupations in the blue-collar as well as white-collar group. See Norman Frumkin, Manpower Implications of Alternative Priorities for Coping with Poverty, prepared for the Manpower Administration of the U.S. Department of Labor, April, 1968. p. 122.

[2] Sol Swerdloff, "Manpower Projections: Some Conceptual Problems and Research Needs," Monthly Labor Review, February 1966. pp. 138-143.

VII. MANPOWER NEEDS FOR ACHIEVING NATIONAL GOALS IN THE 1970's

The employment projections discussed in the previous chapter represent an estimate of the probable magnitude of the demand for manpower in 1985 under the two alternative assumptions of productivity growth -- one reflecting a moderate and the other a rapid pace of technological advance. The two sets of projections served to illustrate differentials in manpower impacts. This chapter is also concerned with manpower requirements projections, but it views them from a quite different vantage point -- namely, what would be required for the achievement by 1975 of an illustrative set of national goals aimed at improving American standards of living, including areas such as health, education, urban development, natural resources, and industrial plant and equipment. This aspect of the research is largely an outgrowth of NPA's previous study conducted for the U.S. Department of Labor.[2] NPA's Office of Education pilot study has prepared employment opportunities for nonwhites and educational attainment and training requirements for individual goals.

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[1] The Michigan Manpower Study: An Analysis of the Characteristics of Michigan's Labor Force in the Next 15 Years. Columbus, Ohio: Battelle Memorial Institute, November 1966.

[2] See Leonard A. Lecht, Manpower Requirements for National Objectives in the 1970's. Prepared for the U.S. Department of Labor, Manpower Administration. February 1968. p. 471.

1. Occupational Profiles for Individual Goals: Overall Implications

The nation's employment requirements, occupational mix of employment, and job preparation in the coming decade will be significantly affected by where and how we assign our priorities. And they will present different alternatives for planning by the educational system. According a high priority to rehabilitating our decaying cities, for example, would generate a substantial increase in employment for blue collar workers, and particularly for carpenters, plumbers, electricians, and others in the building trades occupations. The projections for achieving our objectives in research and development, or health, on the other hand, would lead to a substantial increase in requirements for professional and technical workers such as scientists and engineers, physicians, and nurses. Implications for education are profound. Supplying engineers or physicians, for example, would require a considerably greater amount of educational preparation and an advance planning in educational programs and facilities than supplying carpenters or plumbers. It is therefore important to examine the implications of individual goals for manpower requirements and for education and training.

The dollar costs for achieving individual goals included in these estimates vary considerably, ranging from only $12 billion for the international aid goal to $674 billion for the consumer expenditures goal. See Table 2. Because of this variation, the manpower required for the attainment of these goals also indicates a broad range. Table 8 shows the overall manpower requirements for individual goals.

TABLE 8

Estimated Manpower Requirements for Individual Goals, a/
1962 and Projected 1975
(number in thousands)

Goal Area	1962 Number	1962 Rank	Projected 1975 b/ Number	Projected 1975 b/ Rank	% Increase, 1962 to 1975
Consumer Expenditures	42,489	1	58,649	1	38%
Health & Education	9,069	2	17,140	2	89
Housing	3,425	8	5,422	7	58
International Aid	509	11	812	11	60
National Defense c/	3,457	7	3,264	9	-6
Natural Resources	652	10	1,201	10	84
Private Plant & Equipment	5,586	4	11,250	3	101
Research & Development d/	2,259	9	4,295	8	90
Social Welfare	4,593	5	8,395	5	83
Transportation	3,961	6	5,972	6	51
Urban Development	6,336	3	10,160	4	60

Source:

Leonard A. Lecht, Manpower Requirements for National Objectives in the 1970's. Prepared for the U.S. Department of Labor, Manpower Administration. February 1968.

a/ This table lists only twelve goals for which it was possible to estimate separately the manpower requirements. Because of a basic data problem, the occupational requirements for the health and education goals were treated as if the two were one goal. The estimates for employment include both the direct employment in the industries producing the goods and services each goal requires for its pursuit, and the indirect employment in the industries supplying inputs to the firms producing these goods and services.

b/ Refers to the estimated manpower requirements for the "aspiration" goals (that is, for achieving the standards) in 1975.

c/ Refers to employment generated in industry because of purchases of goods and services for national defense. This includes government employment in the industrial sectors for which there are counterparts in the private economy, i.e., in shipyards, ordnance plants, transportation, etc.

d/ Includes space research and development.

The overall manpower needs for the individual goals listed in Table 8 indicate no dramatic changes in claims of the different goals on the economy's manpower resources in the next decade. The four goals which employed the largest numbers of workers in 1962, for instance, are expected to continue to possess the same position in 1975. They are, in the order of magnitude, the consumer expenditures goal, health and education considered as a single goal, the private plant and equipment goal, and the urban development goal. Each of these goals would require the employment of at least 10 million persons in 1975. The standards for each of these four goals list expenditures in 1975 of $100 billion or more. The largest percentage increases are listed for the private plant and equipment goal, over 100 percent; the research and development goal, 90 percent; and the health and education goal, 89 percent. As shown in Table 8, manpower requirements for the national defense goal are expected to decline slightly over the 1962-75 period, from 3.5 million to 3.3 million persons. The decline in employment reflects the only slight increase anticipated in spending for the defense goal and the rapid growth in productivity in many defense-related industries.

As stated earlier, the individual goals also vary widely in their manpower needs in the different occupational groups. To indicate the differing occupational requirements of each goal, Table 9 summarizes the percent distribution of the projected 1975 employment requirements for individual goals by major occupational group. The following discussion highlights some of the differences in the occupational requirements for selected goals.

Improving our standards of living including family allowance system to increase to $3,300 the incomes of families below this level in 1975 is expected to require a large number of white collar workers (nearly half of the total). A fourth of the total employment will be in clerical and sales occupations, largely made up of bookkeepers, secretaries-

TABLE 9

Occupational Distribution of Manpower Requirements for Individual Goals, for Aspiration Goals in 1975

Goal Area	Percent of All Occupations						
	White Collar Workers			Blue Collar Workers		Service Workers	Farm Workers
	Professional, technical	Managers	Clerical, sales	Craftsmen, foremen	Operatives, laborers		
Consumer Expenditures	12.4%	11.6%	24.6%	10.3%	19.4%	16.6%	5.1%
Health and Education	44.2	2.5	15.6	6.7	8.7	21.8	0.6
Housing	8.2	10.0	14.8	34.0	27.7	3.6	1.7
International Aid	12.9	7.2	19.1	13.9	22.3	4.9	19.7
National Defense	21.9	6.7	16.9	19.0	29.6	4.6	1.3
Natural Resources	15.9	8.3	15.5	21.7	24.8	10.6	3.2
Private Plant and Equipment	13.0	10.6	18.2	21.9	31.6	4.2	0.4
Research and Development	36.4	6.0	14.1	13.1	25.5	4.4	0.5
Social Welfare	17.1	10.5	23.0	9.0	17.2	17.0	6.3
Transportation	10.3	10.3	18.2	23.6	32.2	4.5	0.8
Urban Development	9.1	11.0	17.0	29.4	28.3	4.0	1.2
TOTAL Economy [1]	14.2	10.7	22.8	12.2	21.5	14.6	4.0

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[1] Refers to GNP growing at an annual rate of about 4.5 percent between 1964 and 1975.

stenographers-typists, and retail salesworkers. Blue Collar workers, as a group, on the other hand, are expected to account for about 30 percent of total employment, roughly maintaining their 1962 share.

Assigning a high priority to the achievement of health and education goals would involve considerably large numbers of highly trained professional and technical workers which would comprise over 44 percent of the total in 1975. On an economy-wide basis, professional and technical workers would account for only 14 percent in 1975. Elementary and secondary school teachers and college professors are projected to rise by over 82 percent in the next decade, accounting for 42 percent of total professional and technical workers projected for the health and education goals. Over 26 percent of professional and technical workers will be represented by health-related occupations such as dentists and physicians, nurses, and medical technicians. Largely because of growing requirements for hospital attendants and practical nurses, service workers are also expected to comprise a large proportion of total employment -- over a fifth. The substitution of auxiliary personnel to perform many of the routine tasks formerly done by physicians and dentists accounts for much of the expected growth in demand for nurses, medical technicians and hospital attendants. The employment requirements in these occupations is projected to rise by 120 percent in the next decade.

Concentrating on our objective to create the productive capacity of the economy through increased outlays for plant and equipment would require over 11.2 million workers in 1975 as compared with 5.6 million in 1962. Over 53 percent of the total in 1975 represents requirements for blue collar workers, mainly semi-skilled operatives or skilled craftsmen. Another 42 percent is accounted for by white collar workers. It is interesting to note that the two occupations showing the largest employment needs are engineers (553,000) and laborers (735,000) -- occupations at the opposite extremes in terms of education and training. These two occupations together account for over 11 percent of total employment.

Pursuit of the research and development goal, like that of the health and education goal, would create employment for a large number of professional and technical workers, primarily engineers, scientists, and technicians. Over 36 percent of total employment in 1975 will be represented by workers in professional and technical occupations. Expenditures for the R and D goal would also generate employment for substantial numbers of workers with other, and often lesser, occupational skills -- managers, secretaries, stenographers, typists, mechanics and repairmen, laborers, and service workers. Operatives and laborers, for instance, account for over a fourth of the total employment requirements in 1975.

If the nation were to assign a high priority to rebuilding our cities in the next decade, over 10 million persons would be employed in constructing urban facilities or manufacturing the equipment they utilize. Achievement of the urban development goal would result in large increases in manpower requirements in many skilled crafts usually requiring long periods of apprenticeship and often high qualifications for entrance. Nearly 30 percent of the total employment needs in 1975 would be in crafts occupations, largely consisting of carpenters, plumbers, painters, foremen, and mechanics and repairmen. These five occupational groups make up 54 percent of total craftsmen. Another 30 percent of the total employment in 1975 would be represented by semi-skilled operatives and laborers. Professional and technical workers would account for only 9 percent of the total in 1975.

2. The Pursuit of Individual Goals and Job Opportunities for Nonwhites

In terms of manpower waste through unutilization and underutilization, nonwhites represent proportionately a much larger segment of our population which is not being fully utilized. Over 800,000 unemployed nonwhites and their unemployment rate of nearly 10 percent in 1964 offer an important opportunity to promote maximum utilization of human resources. Withdrawals from the work force,[1] involuntary part-time employment, and employment below the potential skill level of nonwhite individuals also result in a tremendous loss of manpower for the economy.

Social barriers in employment in the past played a critical role in retarding manpower development for nonwhites. They are still largely concentrated in the low-paying, low-skill, and high-unemployment-prone occupations. Comparisons of occupational characteristics of whites and nonwhites illustrates our failure to utilize nonwhites in their potentially more productive employment. As late as 1964, the proportion of nonwhites employed in white collar occupations amounted to 19 percent as compared with over 47 percent for whites. On the other hand, the percent employed in unskilled jobs as private household workers or as laborers was over 27 percent for nonwhites and only 6 percent for whites.[1]

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[1] It has been estimated that out of the 1 1/4 million men (25 to 54 years of age) not in the work force in 1966, one-fifth were nonwhites, although nonwhite men accounted for only one-tenth of the total population in this age group. See Manpower Report of the President, April 1967. p. 133.

If we are to reduce the unemployment rate for nonwhites to a level comparable to the national average, the job opportunities for them must expand at a much more rapid pace than the nation-wide increase in employment. Furthermore, if the nation is to better utilize the nonwhite segment of our human resources, individuals in the nonwhite group must be allowed to enter at a massive scale into the rapidly growing, better paid occupations in the white collar, skilled craft, and service fields.

Our society's choice of priorities is expected to greatly influence employment opportunities and occupational mix of employment for nonwhites in the next decade. Attainment of the health and education goal in the 1970's, for example, would increase the employment of nonwhites by more than 120 percent between 1962 and 1975. This compares with a projected increase of only 50 percent in nonwhite employment for achieving the consumer expenditures goal over the same period. On an economy-wide basis, the number of nonwhites employed is projected to rise by 40 percent over the next decade. If we are to concentrate our resources on the health and education goal in the coming decade, the proportion of nonwhites employed in white collar jobs would grow from less than 30 percent of total employment for these workers in 1962 to 40 percent by 1975. For the consumer expenditures goal, the proportion would rise from 15 percent to 23 percent over the same period.

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[1] U.S. Department of Labor, Bureau of Labor Statistics, Special Labor Force Report, No. 52. April 1965. Table C-7, p. A-22.

To examine the implications of the nation's choices of priorities, Table 10 summarizes the nonwhite job-generating potentials of individual goals in terms of the nonwhite employment needed per billion dollars of expenditures for the activities associated with the pursuit of each goal in 1962 and 1975. The eleven goals have been grouped into three classes according to the estimated number of nonwhite jobs to be created in the mid-1970's.

TABLE 10

Nonwhite-Job-Generating Potential of Individual Goals, 1962 and Projected 1975

Goal Area	Nonwhite Employment Per Billion Dollars of Expenditures 1/ 1962	Projected 1975
	(number employed in 000)	
A. High Job Potential		
Consumer Expenditures	13.0	10.6
Health and Education	15.5	12.7
Housing	11.8	10.4
Social Welfare	13.3	11.2
B. Average Job Potential		
International Aid	11.0	8.0
Natural Resources	10.4	8.5
Research and Development	9.5	8.7
Urban Development	11.2	9.6
C. Low Job Potential		
National Defense	8.1	6.5
Private Plant and Equipment	9.6	7.0
Transportation	9.7	7.9

1/ Refers to final demand expenditures expressed in 1962 prices.

The intensity of utilization of nonwhite workers in the mid-1970's would vary considerably depending on which goals we choose. Heading the list is the health and education goal which is expected to generate in 1975 12,700 jobs for nonwhites per each 1$ billion of final demand expenditures. Other goals which would create the employment of at least 10,000 nonwhite persons per billion dollars of expenditures in 1975 are social welfare, consumer expenditures, and housing. On the other hand, the same amount of money is anticipated to generate only 7,000 job positions for nonwhites in the 1970's if it is spent on activities related to providing industrial plant and equipment.

The more rapid percentage increase projected for nonwhites than for whites is many occupations implies an increase in proportion as well as in the number of nonwhites employed in these fields in the next decade. Our projections are based on historical trends (1950-1964) in nonwhite employment by occupation, and on judgements concerning the impact of current developments in changing these trends in the next decade. The judgements take into account the combined effects of economic growth, the lessening of discrimination, and the requirements associated with specific goals for nonwhite employment opportunities.

The manpower requirements growing out of the active pursuit of national objectives thus represent both a challenge and an opportunity to upgrade the economic status of nonwhites in the next decade. Expanding employment opportunities for nonwhites would require a concerted effort by all segments of our society -- schools, government, employers, and labor unions -- to enlarge educational and training programs, and to break down discriminatory practices in employment. By utilizing more of the available work force, and utilizing them more effectively, these measures would also significantly increase our nation's capacity for achieving its goals.

3. The Pursuit of Individual Goals and Changing Level of Education and Training Requirements

There has been continuous improvement in the educational attainment of the American work force over the past decades. The response of American workers to the demands of our rapidly changing, technological society is clearly demonstrated in the rising proportions of those graduating from high school and those completing four years of college or more.

The manpower requirements stemming from the vigorous pursuit of national objectives in the coming decade are expected to bring about further advances in educational status of American workers. Pursuit of individual goals would also generate employment for workers with varying educational and skill levels, and there are expected to be marked differences in the educational and training profiles associated with each goal. The anticipated educational profiles for the eleven goals in the 1970's are summarized in Table 11. More detailed distribution of educational attainment for each goal is presented in Appendix Table 9. These projections take account of the distribution of educational attainment in each occupation in 1960, the changes in the distribution by major occupational group between 1959 and 1966, and judgements, particularly based on the age distribution in the different occupations, of the extent to which the 1959-66 changes in educational level are likely to slow down or to accelerate in the coming decade.

TABLE 11

Estimated Distribution of Employment by Level of Educational Attainment in 1962 and 1975, for Individual Goals

Goal Area	1962			Projected 1975		
	Percent of Total Employment Having:		Median Educational Attainment	Percent of Total Employment Having:		Median Educational Attainment
	8 Years of Education or less	4 or more Years of College		8 Years of education or less	4 or more Years of College	
Consumer Expenditures	30.0%	8.6%	11.6	18.3%	11.5%	12.3
Health and Education	19.2	27.4	12.5	11.4	30.2	12.8
Housing	33.5	6.0	11.0	21.7	8.4	12.2
International Aid	38.9	6.9	10.6	23.3	10.6	12.1
National Defense	28.3	9.3	11.8	16.8	13.9	12.4
Natural Resources	31.7	7.8	11.4	18.9	12.6	12.3
Private Plant & Equipment	29.8	8.0	11.6	18.5	10.9	12.3
Research & Development	22.4	18.9	12.3	13.5	21.4	12.6
Social Welfare	29.1	10.3	11.8	17.4	15.0	12.3
Transportation	30.2	7.3	11.4	19.4	9.5	12.2
Urban Development	31.7	7.4	11.3	20.7	9.4	12.2

Table 11 lists for each goal the two extremes of the educational attainment distribution (that is, for college graduates and for those with 8 years of school or less) and median educational attainment of workers for 1962 and 1975. As is evident from the table, there are significant differences in the distribution of educational attainment related to each goal. Concentrating our resources on activities related to health and education in the coming decade could be expected to generate job opportunities for three and a half times as many college graduates as the equivalent spent for realizing the housing goal. Over 30 percent of the workers anticipated to be employed in health and education in the mid-1970's would have 4 or more years of college education. This compares with only 8 percent for the housing goal. Pursuit of both goals would also generate employment for workers with much less educational preparation, those with 8 years or less education. 90 percent more of these workers are expected to be employed for each billion dollars spent for housing construction in 1975 than for health and education. The larger representation of workers at the lower end of the educational attainment distribution for the housing goal reflects the greater importance of blue collar workers in the manpower needs for this goal. It is anticipated that nearly 62 percent of the total employment for the housing goal in 1975 will be in blue collar fields.

The general upgrading of educational level of workers through the mid-1970's is evident in all goals. In terms of median years of schooling completed, however, the rate of gain is anticipated to be highest among activities involving large numbers of blue collar or farm workers characterized by lower educational levels. Urban development, housing, natural resources, transportation, and international aid are cases in point. Median educational attainment is expected to rise by 7 to 15 percent for all of these goals over the next decade. On the other hand, the overall median level of educational attainment is not anticipated to change much for either the health and education goal or the research and development goal. As discussed earlier, the achievement of these goals would require a substantial number of highly trained and well-educated workers in professional and technical occupations where educational levels are already high. A typical worker employed in activities related to health and education or research and development programs in 1962 had already attained years of schooling beyond the level of high school education. Thus, median educational attainment of workers engaged in research and development activities is expected to rise by only 2.4 percent from 12.3 years in 1962 to 12.6 years in the mid-1970's. This compares with the gain of 11 percent from 11 years in 1962 to slightly over 12 years anticipated for the workers, largely in blue collar occupations, needed for realizing the housing goal.

Table 12 shows the estimated distribution of employment by level of occupational skill requirement for eleven goals in the mid-1970's. These estimates are based on the specific vocational preparation (SVP) requirements data derived from the Dictionary of Occupational Titles.[1]

TABLE 12

Estimated Distribution of Employment by Specific Vocational Preparation (SVP) Category in 1975, for Individual Goals

Goal Area	Up to 3 Mos. (1)	Over 3 months & up to 6 mos. (2)	Over 6 months and up to 1 year (3)	Over 1 year & up to 2 yrs. (4)	Over 2 yrs. & up to 4 yrs. (5)	Over 4 years (6)	Average Years of SVP
Consumer Expenditures	22.2%	24.1%	15.8%	6.9%	24.5%	6.5%	1.5
Health and Education	16.3	19.0	3.1	16.6	36.4	8.6	2.1
Housing	15.9	20.0	10.6	7.8	29.0	16.7	2.3
International Aid	18.4	28.5	11.7	8.7	23.7	9.0	1.7
National Defense	14.4	24.8	2.8	11.5	29.0	17.5	2.4
Natural Resources	17.9	20.7	10.1	7.7	32.2	11.4	2.1
Private Plant & Equipment	13.3	27.6	5.3	11.6	28.8	13.4	2.1
Research and Development	9.8	24.0	2.4	9.0	35.5	19.3	2.7
Social Welfare	20.6	24.0	13.2	8.5	28.0	5.7	1.6
Transportation	13.4	26.1	7.1	11.7	33.6	8.1	1.9
Urban Development	14.5	24.8	8.8	7.7	30.1	14.1	2.1

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[1] More detailed discussion of how these estimates have been made is presented in the following chapter.

It will be noted from Table 12 that there is a considerable dispersion in the distribution in all of the eleven goals. However, 2 to 4 years of vocational preparation would be by far the most typical training requirement for almost all goals. In the case of the two goals characterized by the large representation of professional and technical workers, i.e., the health and education goal and the R & D goal, about 36 percent of the jobs would require 2 to 4 years of vocational training. But as many as a fourth of the R & D related jobs and a fifth of the jobs connected with the health and education programs may require only 3 to 6 months of training. Among the jobs associated with the international aid activities, 3 to 6 months of vocational preparation would be the most frequent skill requirement, but a fourth of the jobs would require 2 to 4 years of occupational training, while another fifth requires only 3 months of training or less. The larger representation of workers with relatively long periods of occupational training (over 2 years) in housing, urban development, and national defense largely reflects the fact that the occupational requirements for achieving these goals are largely concentrated in many skilled crafts requiring lengthy training and often high qualifications for entrance.

The last column in Table 12 lists average years of training requirements for individual goals. As is apparent from the table, pursuit of individual goals would generate jobs requiring widely varying levels of vocational training, ranging from 1.5 years for jobs associated with consumer expenditures to 2.7 years for the R & D related jobs.

VII. IMPLICATIONS FOR EDUCATION AND TRAINING

The overall conclusion which emerges from this study is that the anticipated economic and manpower developments considered in this paper clearly point to the importance of education as a life-long learning process involving many educational and training institutions. The tempo of changes in our complex economic, political, scientific, and social institutions is such that education can no longer be considered as a static, one-shot process terminating at an early phase of our lifetime. Educational and vocational preparation is going to play an increasingly important role in determining the work and careers of the population in a rapidly changing society. Whether in the form of formal schooling or informal learning through training, the nation's educational system will continue to be a cornerstone for the development of its human resources.

As has been discussed elsewhere in this paper, the next decade or two will witness some fundamental changes in the relationship between education and employment. The interaction between education and the world of work can be brought into focus by a consideration of the anticipated changes in occupations requirements in the next ten or twenty years. With the projected growth in the nation's economy, the number of manual workers is expected to decline rapidly in the future. And the effects of automation and mechanization would eliminate many unskilled, routine jobs. At the same time, the economy will open up opportunities for a growing proportion of persons with professional and technical skills, i.e., those with college education. Another development will be the rapid expansion of white collar occupations below professional and technical level, i.e., in clerical and service fields. These are the jobs for which a high school graduation or junior college education will increasingly become prerequisites.

1. Educational Attainment and Skill Requirements in the 1970's

The level of educational attainment in the United States has been increasing rapidly in the past decades and the increases are expected to continue. The needs of the growing economy and the requirements growing out of the pursuit of national objectives would further raise the educational level of the American workers in the future. This reflects the anticipated rapid expansion of those occupations requiring the highest degree of education and training. Professional and technical workers as a whole, for instance, are projected to grow by 44 percent over the 1964-75 period as compared with 25 percent for total employment (see Appendix Table 5). The level of education of these workers now represents more than four years of college and even more schooling is expected to be required over the next decade. In spite of this increase in educational levels, there will still be a large number of poorly educated marginal workers in the work force. Nearly 38 percent of the workers would still be made up of persons with less than four years of high school education in 1975. It is thus anticipated that the problems of dropouts and functional illiterates, particularly among minority groups, will continue to plague our educational system in the next ten or twenty years, although on a lesser scale than in the recent past.

Table 13 shows the projected changes in the distribution of employed civilian labor force by level of educational attainment between 1962 and 1975. These estimates have been derived in the same method as the projections of educational attainment discussed in the previous chapter.

TABLE 13

Distribution of Employed Civilian Labor Force by
Level of Educational Attainment, 1962 and Projected 1975

Years of Schooling Completed	Percent Distribution 1962	Percent Distribution 1975	Percent Change in Proportion 1962 to 1975
8 Years or less	29.2%	17.4%	-40.4
1-3 Years of High School	22.0	20.4	- 7.3
4 Years of High School	28.3	35.5	+25.4
1-3 Years of College	10.6	13.1	+23.6
4 Years of College or more	9.9	13.6	+37.4
TOTAL	100.0%	100.0%	

Overall, the proportion of workers graduating from high school is anticipated to rise from over 28 percent in 1962 to nearly 36 percent in 1975, and 14 percent will have completed a full 4 years of college, as compared with 10 percent in 1962. The increase in the proportion of the work force with one to three years of college education from less than 11 percent to over 13 percent largely reflects an expected rapid growth in the number of junior college graduates.

Advances in educational attainment are also evident in virtually all occupations, though there will be wide differences in educational level among occupational groups. Table 14 tabulates the median educational attainment for broad occupational categories for 1962 and 1975.

TABLE 14

Median Educational Attainment of Employed Civilian Labor Force by Broad Occupational Group, 1962 and Projected 1975

Occupational Group	1962	Projected 1975	Percent Change, 1962 - 1975
White Collar Workers			
1. Professional & Technical	16.1	16.4	1.9%
2. Managers, Officials & Proprietors	12.5	12.9	3.2
3. Clerical & Sales	12.3	12.4	0.8
Blue Collar Workers			
1. Craftsmen & Foremen	10.6	12.0	13.2
2. Operatives & Laborers	9.6	10.9	13.3
Service Workers			
1. Private Household Workers	8.7	9.8	12.6
2. Other Service Workers	10.2	11.7	14.7
Farm Workers	8.6	8.9	3.5
TOTAL	11.7	12.3	5.1

For white collar workers as a whole, some college education was already common in 1962 with professional and technical workers exceeding four years of college. No significant changes in educational attainment are expected for these workers. The rate of advance will be highest among blue collar and service workers -- occupations in which median educational attainment is low. The projected changes represent a continuation of the trend experienced during the past decade.[1] Educational attainment is by no means a perfect measure of the full training and work skill background of the labor force. It is very difficult to ascertain to what extent these data on the educational attainment would actually represent educational and training requirements to fill a certain job. Nevertheless, it provides the base on which the more specialized skills and knowledge of our technologically oriented economy must be built.

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[1] See Denis F. Johnston, "Educational Attainment of Workers, March 1962." Monthly Labor Review, May 1963. p. 507.

The United States Bureau of Employment Security has undertaken an extensive study to estimate the amount of education and training required by specific jobs, and tabulated a sample of some 4,000 jobs in the Dictionary of Occupational Titles (DOT) according to specific vocational preparation required by each. The type of information contained in the DOT thus has the potential for use in educational planning and provides a point of departure for estimating skill requirements on the basis of required occupational structure. Relating these data on skill needs to our projected occupational requirements would then indicate the magnitude of projected demands on the educational and training institutions. This method could tell us not only what specific occupations to train for, but also the amount of training required to meet the occupational needs in the future. It would also provide the necessary basis for calculating the costs of creating a labor force with the desired set of skills.1/

In order to specify the amount of training required by each job position, we derived data on "Specific Vocational Preparation" (SVP) from the Dictionary of Occupational Titles.2/ SVP is scaled into nine levels, each expressed in terms of the amount of time necessary to "learn the techniques, acquire information, and develop the facility needed for the

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1/ R. S. Eckaus, "Economic Criteria for Education and Training," The Review of Economics and Statistics, May 1964. p. 183.

2/ U. S. Department of Labor, Bureau of Employment Security, Dictionary of Occupational Titles, Vol. II Occupational Classification, Third Edition. Washington, D.C.: Government Printing Office, 1965.

average performance in a specific job-worker situation."[1] Table 15 lists nine SVP categories along with training time equivalent in years for each category. The training year equivalents shown in the table are derived by reducing the ranges of the SVP categories to single numbers, and nine SVP groups have been consolidated into seven for the purpose of this study. The equivalent values shown in Table 15 were then assigned to each occupational category. Estimated for the major occupational groups were computed as weighted averages of their detailed components, based on employment in each occupation. The results are shown in the last column of Appendix Table 8, providing a detailed description of the training requirements of the employed civilian labor force in each covered occupation. Table 16 summarizes the overall results in terms of the distribution of employment by various SVP categories in 1962 and 1975.

Table 16 reveals a general advancing of the skill requirements of the labor force between 1962 and 1975. An analysis of the labor force distribution by SVP category indicates that the need for workers with two to four years of vocational training is anticipated to increase by nearly half over the next decade, as compared with only 29 percent for total employment. They will make up more than a fourth of employed civilian labor force in the mid-1970's, rising from 22 percent in 1962. These workers will be largely concentrated in the professional and technical and crafts occupations. See Appendix Table 8. The proportion of workers in the three highest categories as a whole -- those requiring more than one year of specific vocational preparation -- would rise from 39 per-

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[1] Ibid., p. 652. SVP refers to training provided in any of the following circumstances: vocational education, apprentice training, in-plant training, on-the-job training, and essential experience in other jobs.

TABLE 15

Specific Vocational Preparation Categories
and Training Requirement

SVP Categories	Training Time (DOT)	Training Time (Eckaus)
1	Short demonstration only	0
2	Short demonstration - 30 days	15 days or .041 year
3	30 days - 3 months	60 days or .165 year
4	3 - 6 months	4.5 months or .375 year
5	6 months - 1 year	9 months or .75 year
6	1 - 2 years	1.5 years
7	2 - 4 years	3 years
8	4 - 10 years	7 years
9	Over 10 years	

Sources:

U. S. Department of Labor, Bureau of Employment Security, Dictionary of Occupational Titles, Vol. II Occupational Classification, Third Edition, Washington, D.C.: Government Printing Office, 1965. p. 653.

R. S. Eckaus, "Economic Criteria for Education and Training," The Review of Economics and Statistics, May 1964. p. 185.

TABLE 16

Specific Vocational Training Requirements for Employed Civilian Labor Force, 1962 and Projected 1975

Required Training Period	1962 Number Employed (000,000)	1962 Percent of Total	Projected 1975 Number Employed (000,000)	Projected 1975 Percent of Total
Up to 30 days	9.5	14.0%	10.7	12.2%
Over 30 days up to 3 months	4.7	6.9	7.3	8.3
Over 3 months up to 6 months	16.7	24.6	21.4	24.4
Over 6 months up to 1 year	10.5	15.5	10.6	12.1
Over 1 year up to 2 years	6.4	9.4	8.8	10.1
Over 2 years up to 4 years	14.9	22.0	22.2	25.3
Over 4 years	5.2	7.6	6.7	7.7
TOTAL	67.8	100.0	87.7	100.0

cent to 43 percent over the next decade. Since the same SVP requirements data were applied both to 1962 and 1975 employment data, these estimates only reflect the effects of occupational shifts between the two years. They do not take into account the changes in the smill requirements of the same job that might take place over the projected period. More intensive research on changing job characteristics and skill requirements would be needed to make SVP data more useful and responsive to changes in the socio-economic structure. We will need to know far more than we do now about the effect of technological developments on jobs.

General Education and Occupational Training at the Pre-College Level

Although the number of jobs requiring a college diploma will grow rapidly over the coming decade, these occupations will continue to comprise a small fraction of the total employment through the mid-1970's. Even with the doubling of college enrollment anticipated over the next decade, almost three-fourths of the employed civilian labor force in

1975 will be represented by those with four years of high school or less. (See Table 13). The economic and technological changes which are enhancing the role of higher education for the professional and other white collar occupations are also increasing the significance of general education and training in occupational preparation for those without college education.

The vocational education program has long been one of the problem areas in our school system. The quality and availability of vocational education as a whole is uneven throughout the country. And some of the programs are outdated or underequipped. The Federal Advisory Council on Vocational Education recently reported that vocational education was not readily available to those who need it most -- in rural areas and urban slums. It further suggested that the programs are generally poor in the suburbs because schools there are primarily geared to college-bound students.[1] A breakdown of the enrollment in the Federally supported vocational education programs reveals that over 44 percent of the total in 1964 represented enrollment in home economics and almost 20 percent was enrolled in vocational agriculture.[2] Agriculture now accounts for only 7 percent of total employment and the number is expected to decline further in the coming decade; yet the enrollment in vocational agriculture has increased by 17 percent since 1954. A serious doubt has also been cast in recent years as to the effectiveness of vocational education programs in the occupational preparation of the youth as exemplified in the following conclusion reached by the Institute of Human Resources at the Pennsylvania

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[1] The Washington Post, February 11, 1968.

[2] U. S. Office of Education, Digest of Educational Statistics, 1966, p. 35.

State University: "a clear case cannot be made that vocational education has a direct payoff in the occupational experiences of its graduates."[1]

If our educational system is to offer more meaningful programs in occupational education in the coming decade, vocational education will have to expand training programs consistent with changing employment opportunities and the nation's economic needs. New and improved facilities will be needed to keep pace with increasing demand for marketable skill education. Furthermore, training for specialized skills would require a broader base of general education to prepare individual workers for a rapdily changing technology. Representatives of private industry often expressed dissatisfaction that many of the high school graduates are not fully equipped with the basic learning tool courses in mathematics and related preparation for learning new skills.[2] A broad educational preparation in the acquisition of basic knowledge, skills, and attitudes is a need common to all students, both those who go on to colleges and those who will enter into the work force after graduation from high school. Secondary education can no longer be considered as terminal for many students. Even those who do not seek college education will have to attend technical institutes or adult education classes, enter apprenticeship, take on-the-job training, or study through correspondence courses. They all need, to a greater or lesser extent, a common foundation in high school. High school education thus establishes the basis of eligibility for and adaptability to subsequent education and training. An O.E.C.D. review panel reported in 1964 that the objective of improving the vocational content of education can only be accomplished by adopting school curricula and programs flexible enough to serve a variety of needs on the part of those students who will enter the labor market at various stages as well as those who must also be adequately prepared for a variety of higher level educational and training institutions.[1/]

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[1] Jacob J. Kaufman, et. al., The Role of the Secondary Schools in the Preparation of Youth for Employment, Summary Conclusions and Recommendations, University Park, Pa.: The Pennsylvania State University, 1967. p. 5.

[2] See William Karp, Report of the State of Illinois Commission on Automation and Technological Progress. State of Illinois, April 1, 1967. p. 71.

Adult Education

The increasing level of educational and changing skill requirements in the complex technological society in the 1970's and 1980's clearly points to the need for more massive programs which would further stimulate the development of additional general education and specialized training for out-of-school youth and adults. The American school system is not designed to meet the continuing education needs of our rapidly changing society.[2/] The educational resources of our communities have traditionally been devoted to the education and training of in-school youth, and often overlooked adults who have left the educational system with few job skills and little education. And most of the measures adopted during the past several years to expand facilities in education and training have been focused on the youth of the nation. Yet absence of sufficient education is more common among older workers than among young adults.

[1/] Manpower Policy and Programmes in the United States. Paris: Organization for Economic Co-operation and Development, 1964. p. 104.

[2/] Grant Venn, Man, Education, and Work. Washington, D.C.: American Council on Education, 1964. p. 168.

The average number of years of formal schooling of those in the 50-54 age group was 9.7 years in 1960 which compares to a figure of 10.6 years for the population of 14 years and over. The average for those aged 20, however, was 12.3 years in 1960.[1] This provides a rough measure of the difference in educational attainment between the younger and the older groups in the population.

A great deal of training of adults is at present undertaken in night school and part-time programs, in university extensions, in correspondence courses, and in a variety of other ways. All of these programs are largely voluntary. The schools and universities, however, represent only part of the nation's resources for education and training for adults. For a number of years, now, the armed forces have also functioned as a major educational system and private industry has also been increasing its investment in education and training. The United States Armed Forces Institute currently enroll 258,000 students in hundreds of courses ranging from the grammar school level through college. Furthermore, the Services return over half a million personnel, annually, to the country's skilled manpower pool.[2]

The national importance of continuing education and training of adults in occupational preparation is suggested by the extent to which the Federal government has become involved in it. Concern with measures to increase the employability of persons with limited skills has grown so rapidly over the past five or six years that there are currently 15 to 30 separate

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[1] U. S. Bureau of the Census, U.S. Census of Population: 1960, Detailed Characteristics, U.S. Summary. Final Report PC (1)-1D. Washington, D.C.: Government Printing Office, 1963. Table 173, pp. 1 - 404.

[2] Robert S. McNamara, "World's Largest School," Training, August 1967. p. 20.

Federally supported manpower programs in each major U. S. metropolitan area.[1] The training provisions of the Manpower Development and Training Act and the Job Corps are all a recognition of the need for training as a necessary measure to increase the employability of undertrained and undereducated persons.

This trend toward vocational training outside of the formal school system can be expected to increase in the future. Together with training in schools and universities this would make a fundamental contribution to raising the skill levels and general educational attainment of adult workers to meet the needs of the future. Improving the means through which skilled workers are developed therefore would require a careful consideration of all these institutions and of how they can be better utilized together for increasing the employment opportunities of individuals and the quality of the nation's labor force.

High-Level Manpower Requirements and the Role of Higher Education

It has already been noted that a demand for highly trained manpower is expected to increase considerably in the next decade as a result of advances in science, technology and a rising income. The number of persons engaged in the professional and technical fields would grow 80 percent more rapidly than the total employment between 1964 and 1975. Although the professional and technical workers group includes many people in occupations for which college graduation is not normally required, e.g., actors, technicians, or musicians, the median educational preparation of this group now well exceeds four years of college. And the proportion of those who would be receiving some form of higher education is anticipated to increase from 21 percent of the employed civilian labor force in 1962 to 27 percent by the mid 1970's. See Table 13.

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[1] Statement by the Secretary of Labor, W. Willard Wirtz, cited in Sar A. Levitan and Garth L. Mangum, Making Sense of Federal Manpower Policy, The Institute of Labor and Industrial Relations, the University of Michigan and Wayne State University, March 1967, p. 12.

The nation's higher education institutions in the future can be expected to assume a much greater responsibility for the education and training of highly skilled manpower resources. The enrollment in all institutions of higher education is projected to rise from 4.2 million in 1962 to 9 or 9.5 million by 1975.[1] Higher education on this massive scale would certainly become an important factor in determining the size and the distribution of the total supply of professional, technical, managerial and other semi-professional manpower. Mass higher education is closely related to occupational preparation as well as to the desire for general education. Occupational education is no stranger to colleges and universities. The recent dramatic development of two-year colleges underscores the importance of occupationally oriented curricula in the post-secondary education. The two-year junior or community college at present serves three main objectives. It represents two years of low cost terminal education beyond high school in liberal arts studies. It also serves as a feeder to the larger four-year institutions, thus reducing the living costs of students. Thirdly, it is geared to providing a large number of vocationally oriented courses to prepare people more specifically to enter an occupation.[2] Occupational curricula in the junior colleges are largely concentrated in technician fields, as medical and engineering technicians, and in semi-professional fields such as drafting. These are areas where employment opportunities are expected to grow most rapidly over the next decade or two.

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[1] U. S. Office of Education, Projections of Educational Statistics to 1975-76, 1966 Edition. Washington, D.C.: U.S. Government Printing Office, 1966. p. 9. and Leonard A. Lecht, Goals, Priorities, and Dollars: The Next Decade, op. cit. p. 157.

[2] Eli Ginzberg, "Education and National Efficiency," in Education and Manpower. Edited by Henry David. New York: Columbia University Press, 1960. p. 29.

In 1964 there were about 660 community and junior colleges enrolling nearly one million students in programs geared either for transfer to four-year colleges or immediate entry into the labor market. About 28 percent of this total enrollment was represented by students in occupational or general studies programs not creditable toward a bachelor's degree.1/ The American Association of Junior Colleges estimates that the number of enrollment would rise to over 2.9 million by 1972.2/ The anticipated growth of two-year colleges, with their promise of advanced education for millions of students who might previously not have gone beyond the 12th grade, will mark the new era in American higher education in the coming decade. But the many potentials of the two-year colleges carry with it challenges and problems. Community colleges often face problems in recruiting a collegiate-level faculty and in developing a curriculum of collegiate calibre. The urban community colleges will face a major responsbility for bringing more minority group students into the educational mainstream. Expanding educational opportunity is the strategic ingredient in our programs for coping with poverty and racial discrimination.

1/ U. S. Office of Education, Opening (Fall) Enrollment in Higher Education, 1964. Washington, D.C.: Government Printing Office, 1964. pp. 5 and 12.

2/ American Association of Junior Colleges, Directory. Washington, D.C.: The Association, 1968. p. 7.

The growing demands for persons needed for occupations and functions requiring first professional or advanced degrees in the future are expected to enhance the role of graduate education. Graduate education is the rapidly expanding segment of higher education. Graduate enrollment is anticipated to increase by 164 percent between 1962 and 1975, compared with an increase of 116 percent for the undergraduate.[1/] Educators predict that the number of graduate degrees awarded from 1966 to 1975 would surpass the previous total for the past half-century.[2/] A high premium placed on holding a graduate degree for job promotion and earning would encourage many students for whom a bachelor's degree would once have been sufficient to obtain advanced degrees. The rising expectations of the general population would also have the effect of raising the requirement from a college diploma to a master's degree and from a master's degree to the doctorate in the ascending hierarchy of the occupational ladder. An increased flow of adult part-time students seeking to upgrade skills or make intelligent use of leisure time will be another important factor affecting the graduate schools of the future.[3/] Graduate education will continue to be the expensive level of education. Greater efforts will have to be made to reduce, if not eliminate, the influence of family income as a factor in determining who should receive graduate education. In order to carry on a task of developing highly skilled manpower resources in the coming years, there must be increased support and encouragement for graduate education from every possible source.

[1/] Leonard A. Lecht, loc. cit.

[2/] "Population Trends Signal School Needs," NEA Research Bulletin, March 1968. p. 27.

[3/] Bruce Dearing and G. Peter Lederer, "Trends in Graduate Education," American Education, February 1968. p. 7.

APPENDIX TABLE 1-1

Economic and Demographic Projections, 1964 and Projected 1975 and 1985

Items	1964	Projected Years		
		Moderate Productivity Growth 1/		Rapid Productivity Growth 2/
		1975	1985	1985
Total Population (in millions)3/	192.1	223.8	264.6	264.6
Population, 14 Years and Over (in millions)3/	136.1	162.8	186.2	186.2
Total Labor Force (in millions)4/	77.0	94.1	108.1	106.7
Labor Participation Rate (percent)	56.5	57.8	58.1	57.3
Total Employment (in millions)	73.1	90.4	103.8	102.5
Civilian Employment (in millions)	70.4	87.7	101.1	99.8
Average Weekly Hours of Work	38.5	36.8	35.4	34.0
Total Manhours (billions)	146.3	173.0	191.2	180.7
GNP (in billions of 1964 dollars)	631.7	1,025.0	1,547.0	1,641.0
GNP per Manhour (in 1964 dollars)	4.32	5.93	8.09	9.08

Source and Notes:

Derived from various government sources and National Planning Association, *National Economic Projections to 1976/77*, NEPS Report No. 66-N-1.

1/ Refers to GNP per manhour growing at an average annual rate of about 3.0 percent between 1964 and 1985.

2/ Refers to GNP per manhour growing at an average annual rate of about 3.6 percent between 1964 and 1985.

3/ Series B projection of the U. S. Bureau of the Census.

4/ Based on the labor force definition of persons 14 years of age and over.

APPENDIX TABLE 1-2

Average Annual Percent Rates of Change, Selected Economic and Demographic Indicators, 1948-1965 and 1964-1985

Indicators	1948-1965	1964 - 1985 Moderate Productivity Growth	Rapid Productivity Growth
Population	1.7%	1.5%	1.5%
Total Labor Force	1.3	1.6	1.6
Total Employment	1.2	1.7	1.6
Average Weekly Hours of Work	-0.4	-0.4	-0.6
Total Manhours	0.9	1.3	1.0
GNP	3.8	4.3	4.7
GNP per Manhour	2.9	3.0	3.6

Source:
Derived from Appendix Table 1-1 and National Planning Association, *op. cit.*

APPENDIX TABLE 2-1

Total Population by Age and Sex, 1964 and Projected 1975 and 1985
(Number in millions)

Sex and Age Group	Actual 1964	Projected Years 1975	Projected Years 1985	Percent Change, 1964-1985
Both Sexes				
All Ages	192.1	223.8	264.6	37.7%
Under 14 Years	56.0	61.0	78.4	40.0
14 Years and Over	136.1	162.8	186.2	36.8
14 - 24	33.0	44.4	46.2	40.0
25 - 34	22.3	31.4	40.7	82.5
35 - 44	24.6	22.5	31.4	27.6
45 - 54	21.8	23.5	21.7	-0.5
55 - 64	16.7	19.8	21.2	26.9
65 and over	17.8	21.2	25.0	40.4
Male				
All Ages	94.7	109.9	130.1	37.4
Under 14 Years	28.5	31.1	40.0	40.4
14 Years and Over	66.2	78.8	90.1	36.1
14 - 24	16.7	22.5	23.5	40.7
25 - 34	11.1	15.7	20.4	83.8
35 - 44	12.0	11.1	15.6	30.0
45 - 54	10.6	11.3	10.6	---
55 - 64	8.0	9.3	9.8	22.5
65 and over	7.9	8.8	10.2	29.1
Female				
All Ages	97.4	113.9	134.5	38.1
Under 14 Years	27.5	29.8	38.4	39.6
14 Years and Over	69.9	84.1	96.1	37.5
14 - 24	16.3	22.0	22.7	39.3
25 - 34	11.2	15.7	20.3	81.3
35 - 44	12.5	11.4	15.8	26.4
45 - 54	11.1	12.2	11.2	0.9
55 - 64	8.7	10.6	11.4	31.0
65 and over	10.0	12.3	14.8	48.0

Sources:

U. S. Bureau of the Census, Current Population Reports, Series P-25, No. 321. November 30, 1965 and Series P-25, No. 381. December 18, 1967. Projections refer to Series B.

NOTE: Detail may not add to totals due to rounding.

APPENDIX TABLE 2-2

White Population by Age and Sex,
1964 and Projected 1975 and 1985
(Number in millions)

	Actual	Projected Years		Percent Change,
Sex and Age Group	1964	1975	1985	1964-1985
Both Sexes				
All Ages	169.4	195.1	227.8	34.5%
Under 14 Years	47.7	50.9	64.9	36.1
14 Years and Over	121.7	144.2	162.9	33.9
14 - 24	28.9	38.2	38.8	34.3
25 - 34	19.6	27.6	35.1	79.1
35 - 44	21.9	19.8	27.7	26.5
45 - 54	19.6	21.1	19.3	-1.5
55 - 64	15.2	18.0	19.1	25.7
65 and over	16.5	19.5	22.9	38.8
Male				
All Ages	83.7	95.9	112.2	34.1
Under 14 Years	24.4	26.1	33.2	36.1
14 Years and Over	59.3	69.8	79.0	33.2
14 - 24	14.6	19.3	19.8	35.6
25 - 34	9.8	13.9	17.7	80.6
35 - 44	10.8	9.9	13.8	27.8
45 - 54	9.6	10.2	9.4	-2.1
55 - 64	7.3	8.4	8.9	21.9
65 and over	7.2	8.1	9.3	29.2
Female				
All Ages	85.8	99.2	115.6	34.7
Under 14 Years	23.4	24.9	31.6	35.0
14 Years and Over	62.4	74.3	84.0	34.6
14 - 24	14.2	18.7	19.1	34.5
25 - 34	9.8	13.8	17.4	77.6
35 - 44	11.1	10.0	13.8	24.3
45 - 54	10.0	10.8	9.8	-2.0
55 - 64	7.9	9.6	10.2	29.1
65 and over	9.3	11.4	13.6	46.2

Sources:

U. S. Bureau of the Census, Current Population Reports, Series P-25, No. 321. November 30, 1965 and Series P-25, No. 381. December 18, 1967. Projections refer to Series B.

NOTE: Detail may not add to totals due to rounding.

APPENDIX TABLE 2-3

Nonwhite Population by Age and Sex, 1964 and Projected 1975 and 1985
(Number in millions)

Sex and Age Group	Actual 1964	Projected Years 1975	Projected Years 1985	Percent Change, 1964-1985
Both Sexes				
All Ages	22.7	28.7	36.8	62.1%
Under 14 Years	8.3	10.0	13.6	63.9
14 Years and Over	14.4	18.7	23.3	61.8
14 - 24	4.1	6.2	7.4	80.5
25 - 34	2.7	3.8	5.6	107.4
35 - 44	2.6	2.6	3.7	42.3
45 - 54	2.1	2.5	2.4	14.3
55 - 64	1.5	1.8	2.1	40.0
65 and over	1.4	1.7	2.1	50.0
Male				
All Ages	11.0	14.0	18.0	63.6
Under 14 Years	4.1	5.1	6.8	65.9
14 Years and Over	6.9	8.9	11.1	60.9
14 - 24	2.0	3.1	3.7	85.0
25 - 34	1.3	1.9	2.7	107.7
35 - 44	1.2	1.2	1.8	50.0
45 - 54	1.0	1.1	1.1	10.0
55 - 64	0.7	0.8	0.9	28.6
65 and over	0.6	0.7	0.8	33.3
Female				
All Ages	11.6	14.8	18.9	62.9
Under 14 Years	4.1	5.0	6.7	63.4
14 Years and Over	7.5	9.8	12.1	61.3
14 - 24	2.1	3.1	3.6	71.4
25 - 34	1.4	1.9	2.8	100.0
35 - 44	1.4	1.4	1.9	35.7
45 - 54	1.1	1.3	1.3	18.2
55 - 64	0.8	1.0	1.2	50.0
65 and over	0.7	1.0	1.2	71.4

Sources:
U. S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 321. November 30, 1965 and Series P-25, No. 381. December 18, 1967. Projections refer to Series B.

NOTE: Detail may not add to totals due to rounding.

APPENDIX TABLE 3-1

Total Labor Force and Labor Participation Rates by Age and Sex, 1964 and Projected 1975 and 1985

	Labor Force (in millions) 1/			Labor Participation Rates		
	Actual	Projected Years 1/		Actual	Projected Years	
Sex and Age Group	1964	1975	1985	1964	1975	1985
Both Sexes						
14 Years and Over	77.0	94.1	108.1	56.5%	57.8%	58.1%
14 - 24	16.0	22.8	23.9	48.5	51.4	51.7
25 - 34	14.8	21.3	27.8	66.4	67.8	68.2
35 - 44	17.2	16.3	22.9	70.1	72.5	73.1
45 - 54	15.7	17.8	16.6	72.3	75.6	76.5
55 and over	13.3	15.8	16.9	38.6	38.5	36.6
Male						
14 Years and Over	51.1	60.5	69.5	77.2	77.0	77.2
14 - 24	10.0	14.1	14.8	60.1	62.7	63.1
25 - 34	10.6	15.1	19.6	96.1	96.1	96.0
35 - 44	11.6	10.7	15.0	96.2	96.4	96.3
45 - 54	10.0	10.7	10.0	94.5	94.7	94.8
55 and over	8.9	9.8	10.1	55.9	54.3	50.5
Female						
14 Years and Over	25.9	33.5	38.6	37.0	39.9	40.1
14 - 24	6.0	8.7	9.1	36.8	39.7	40.1
25 - 34	4.2	6.2	8.2	37.1	39.3	40.5
35 - 44	5.6	5.6	7.9	44.8	49.0	50.4
45 - 54	5.7	7.1	6.6	51.0	57.6	59.7
55 and over	4.4	6.0	6.8	23.5	26.3	26.0

Sources:

Derived from Sophia Cooper and Denis F. Johnston, "Labor Force Projections, by Color, 1970-80," Special Labor Force Report, No. 73, unpublished data from the Bureau of Labor Statistics and National Planning Association, National Economic Projections to 1976/77, NEPS Report No. 66-N-1.

NOTE: Detail may not add to totals due to rounding.

1/ Projections refer to the economy based on GNP per manhour growing at an average annual rate of about 3 percent between 1964 and 1985.

APPENDIX TABLE 3-2

White Labor Force and Labor Participation Rates by Age and Sex, 1964 and Projected 1975 and 1985

Sex and Age Group	Labor Force (in millions) Actual 1964	Projected Years [1/] 1975	1985	Labor Participation Rates Actual 1964	Projected Years 1975	1985
Both Sexes						
14 Years and Over	68.4	83.0	94.2	56.2%	57.6%	57.8%
14 - 24	14.1	19.7	20.2	48.8	51.6	52.0
25 - 34	12.9	18.6	23.8	65.8	67.3	67.8
35 - 44	15.2	14.4	20.1	69.5	72.3	72.8
45 - 54	14.1	15.9	14.8	72.0	75.5	76.6
55 and over	12.1	14.4	15.3	38.1	38.4	36.5
Male						
14 Years and Over	46.0	53.9	61.1	77.6	77.2	77.4
14 - 24	8.9	12.2	12.5	60.5	63.1	63.6
25 - 34	9.5	13.4	17.1	96.7	96.7	96.6
35 - 44	10.4	9.6	13.4	96.7	97.1	97.1
45 - 54	9.1	9.7	9.0	95.1	95.3	95.4
55 and over	8.1	9.0	9.2	55.9	54.4	50.5
Female						
14 Years and Over	22.4	29.1	33.2	36.0	39.2	39.6
14 - 24	5.2	7.5	7.7	36.8	39.9	40.5
25 - 34	3.4	5.2	6.8	35.0	37.7	39.1
35 - 44	4.8	4.8	6.8	43.2	47.8	49.3
45 - 54	5.0	6.2	5.8	49.8	56.9	59.2
55 and over	4.0	5.4	6.1	23.0	25.7	25.6

Sources:

Derived from Sophia Cooper and Denis F. Johnston, "Labor Force Projections, by Color, 1970-80," Special Labor Force Report, No. 73, unpublished data from the Bureau of Labor Statistics and National Planning Association, National Economic Projections to 1976/77, NEPS Report No. 66-N-1.

NOTE: Detail may not add to totals due to rounding.

[1/] Projections refer to the economy based on GNP per manhour growing at an average annual rate of about 3 percent between 1964 and 1985.

APPENDIX TABLE 3-3

Nonwhite Labor Force and Labor Participation Rates by Age and Sex, 1964 and Projected 1975 and 1985

	Labor Force (in millions)			Labor Participation Rates		
	Actual	Projected Years 1/		Actual	Projected Years	
Sex and Age Group	1964	1975	1985	1964	1975	1985
Both Sexes						
14 Years and Over	8.5	11.1	13.9	59.1%	59.2%	59.6%
14 - 24	1.9	3.1	3.7	45.6	49.1	49.9
25 - 34	1.9	2.7	3.9	71.0	71.2	70.5
35 - 44	1.9	1.9	2.8	73.4	74.1	74.6
45 - 54	1.6	1.9	1.9	74.8	76.6	77.0
55 and over	1.2	1.4	1.6	42.4	40.9	38.6
Male						
14 Years and Over	5.1	6.6	8.4	73.9	74.5	75.7
14 - 24	1.2	1.9	2.3	57.0	60.7	61.3
25 - 34	1.1	1.7	2.5	91.7	92.4	92.8
35 - 44	1.1	1.1	1.7	91.2	93.2	93.5
45 - 54	0.9	1.0	1.0	89.2	92.0	92.2
55 and over	0.8	0.8	0.9	55.5	53.8	50.5
Female						
14 Years and Over	3.4	4.4	5.5	45.5	45.3	44.9
14 - 24	0.7	1.2	1.4	34.5	37.7	38.4
25 - 34	0.7	1.0	1.4	52.7	50.9	49.0
35 - 44	0.8	0.8	1.1	57.9	57.6	57.0
45 - 54	0.7	0.9	0.9	61.6	63.6	64.2
55 and over	0.5	0.6	0.7	30.5	30.4	29.7

Sources:

Derived from Sophia Cooper and Denis F. Johnston, "Labor Force Projections, by Color, 1970-80," Special Labor Force Report, No. 73, unpublished data from the Bureau of Labor Statistics and National Planning Association, National Economic Projections to 1976/77, NEPS Report No. 66-N-1.

NOTE: Detail may not add to totals due to rounding.

1/ Projections refer to the economy based on GNP per manhour growing at an average annual rate of about 3 percent between 1964 and 1985.

APPENDIX TABLE 4

Employment by Broad Industry Group, 1964 and Projected 1975 and 1985 (Number in millions)

Industries	1964[1]	Projected Years[2]		Percent Change,	
		1975	1985	1964-75	1964-85
Goods-Producing Industries:	28.4	32.4	35.5	14%	25%
Manufacturing	18.5	21.5	24.0	16	30
Construction	4.5	6.4	8.0	42	78
Agriculture, Forestry and Fisheries	4.9	4.0	3.1	-18	-37
Mining	0.54	0.51	0.46	-6	-15
Service-Producing Industries:	42.0	55.2	65.6	31	56
Service	16.9	23.2	27.9	37	65
Trade	13.5	16.9	19.6	25	45
Public Administration	3.7	5.6	7.0	51	89
Finance, Insurance and Real Estate	3.3	4.8	6.2	46	88
Transportation and Public Utilities 3/	4.6	4.7	4.9	2	7
TOTAL	70.4	87.7	101.1	25	44

Source and Notes:

1/ 1964 data from unpublished Current Population Survey, U. S. Department of Labor.

2/ Based on GNP per manhour growing at an average annual rate of about 3.0 percent between 1964 and 1985.

3/ Includes Communications.

NOTE: Detail may not add to totals due to rounding.

APPENDIX TABLE 5

Employment by Major Occupational Group, 1964 and Projected 1975 and 1985
(Number in millions)

Occupational Group	1964 1/	Projected Years 2/		Percent Change,	
		1975	1985	1964-75	1964-85
White Collar Workers:	31.1	41.8	50.9	34%	64%
Professional and Technical	8.6	12.4	15.9	44	86
Managers, Officials and Proprietors 3/	7.5	9.4	10.9	25	45
Clerical	10.7	14.7	18.3	37	71
Sales	4.5	5.3	5.8	18	29
Blue Collar Workers:	25.5	29.5	32.1	16	26
Craftsmen and Foremen	9.0	10.7	11.8	19	31
Operatives	12.9	14.6	15.5	13	20
Laborers 4/	3.6	4.3	4.8	19	33
Service Workers:	9.3	12.8	15.7	38	69
Private Household Workers	2.3	2.9	3.1	26	35
Other Service Workers	6.9	9.9	12.6	44	83
Farm Workers 5/	4.4	3.5	2.5	-20	-43
TOTAL	70.4	87.7	101.1	25	44

Source and Notes:

1/ 1964 data from Manpower Report of the President, 1965. Washington, D.C.: Government Printing Office, March 1965. Table A-10. p. 202.

2/ Based on GNP per manhour growing at an average annual rate of about 3.0 percent between 1964 and 1985.

3/ Except farm.

4/ Except farm and mine.

5/ Including farm managers.

NOTE: Detail may not add to totals due to rounding.

APPENDIX TABLE 6

Employment by Detailed Occupation, 1962, 1964 and Projected 1975 and 1985[1]
(Number in thousands)

Occupation	1962[2]	1964[2]	Projected Years		Percent Change,	
			1975	1985	1964-75	1964-85
I. Professional, technical and kindred workers	8,040	8,550	12,413	15,916	45%	86%
Accountants and auditors	517	572	732	847	28	48
Airplane pilots and navigators	19	28	59	81	111	189
Architects	40	36	50	58	39	61
College Presidents, Professors and Instructors	172	231	296	380	28	65
Dentists	81	87	117	155	34	78
Designers and Draftsmen	323	308	444	547	44	78
Engineers	1,002	1,059	1,589	2,053	50	94
Lawyers and judges	247	258	337	391	31	52
Librarians	105	112	155	190	38	70
Natural scientists	180	191	280	352	47	84
Nurses, professional	590	592	842	1,098	42	85
Personnel and labor relations workers	113	123	170	209	38	70
Pharmacists	125	124	145	156	17	26
Physicians and surgeons	238	246	309	390	26	59
Social, welfare and recreation workers	176	215	330	433	53	101
Teachers, elementary	976	1,067	1,244	1,690	17	58
Teachers, secondary	596	677	831	890	23	31
Technicians, electrical and electronic	110	125	383	505	206	304
Technicians, medical and dental	171	189	278	384	47	103
Technicians, other	283	280	691	909	147	225
Other professional and technical workers	1,976	2,030	3,131	4,198	54	106

APPENDIX TABLE 6

Employment by Detailed Occupation, 1962, 1964 and Projected 1975 and 1985[1]
(Number in thousands)

Occupation	1962[2]	1964[2]	Projected Years 1975	Projected Years 1985	Percent Change, 1964-75	Percent Change, 1964-85
II. Managers, officials and proprietors, except farm	7,408	7,452	9,406	10,850	26%	46%
Salaried managers	4,053	4,296	6,527	7,647	52	78
Self-employed	3,355	3,156	2,879	3,203	-9	1
III. Clerical and kindred workers	10,107	10,667	14,713	18,341	38	72
Bookkeepers	1,100	1,152	1,497	1,805	30	57
Cashiers	547	606	915	1,214	51	100
Office machine operators	401	418	773	1,163	85	178
Secretaries, stenographers and typists	2,513	2,725	3,813	4,730	40	74
Shipping and receiving clerks	333	358	409	458	14	28
Stock clerks and storekeepers	370	400	609	824	52	106
Telephone operators	330	352	366	393	4	12
Other clerical workers	4,513	4,656	6,331	7,754	36	67
IV. Sales workers	4,346	4,456	5,283	5,786	19	30
Insurance and real estate agents and brokers	534	587	674	726	15	24
Salesmen and sales clerks, retail trade	2,529	2,635	3,028	3,232	15	23
Salesmen and sales clerks, other	1,283	1,234	1,581	1,828	28	48
V. Craftsmen, foremen, and kindred workers	8,678	8,986	10,722	11,793	19	31
Brickmasons, stonemasons and tilesetters	190	195	225	236	15	21
Cabinetmakers and pattern makers	104	98	89	82	-9	-16
Carpenters	816	828	849	840	3	1

APPENDIX TABLE 6

Employment by Detailed Occupation, 1962, 1964 and Projected 1975 and 1985[1]
(Number in thousands)

Occupation	1962[2]	1964[2]	Projected Years 1975	Projected Years 1985	Percent Change, 1964-75	Percent Change, 1964-85
V. continued....						
Cranemen, derrickmen and hoistmen	120	140	161	171	15%	22%
Electricians	386	368	441	483	20	31
Excavating, grading, and road machinery operators	247	272	365	428	34	57
Foremen	1,222	1,237	1,500	1,665	21	35
Linemen and servicemen, telegraph, telephone and power	311	348	367	380	5	9
Locomotive engineers	54	57	62	68	9	19
Machinists and job setters	455	476	548	591	15	24
Mechanics and repairmen, automobile	673	758	932	1,178	23	55
Mechanics and repairmen, other	1,473	1,466	1,869	2,099	27	43
Painters, construction and maintenance	393	425	467	497	10	17
Plumbers and pipefitters	279	304	374	406	23	34
Printing craftsmen	326	341	318	307	-8	-10
Stationary engineers	180	180	217	243	21	35
Tinsmiths, coppersmiths, and sheet metal workers	138	131	137	142	5	8
Toolmakers, diemakers and setters	174	200	231	242	16	21
Other	1,137	1,162	1,570	1,735	35	50

APPENDIX TABLE 6

Employment by Detailed Occupation, 1962, 1964 and Projected 1975 and 1985[1]
(Number in thousands)

Occupation	1962[2]	1964[2]	Projected Years		Percent Change,	
			1975	1985	1964-75	1964-85
VI. Operatives and kindred workers	12,041	12,924	14,560	15,532	13%	20%
Assemblers	593	654	697	710	7	9
Attendents, auto service and parking	388	414	677	879	64	112
Brakemen and switchmen, railroad	125	117	125	132	7	13
Bus drivers	176	174	194	210	11	21
Deliverymen and routemen	490	598	996	1,200	67	101
Checkers and inspectors, manufacturing	516	537	599	625	12	16
Filers, grinders and polishers, metal	171	179	171	162	-4	-9
Laundry and dry cleaning operatives	397	388	404	414	4	7
Mine operatives and laborers	200	208	143	77	-31	-63
Painters, except construction and maintenance	132	132	142	149	8	13
Sewers and stitchers, manufacturing	704	794	1,158	1,485	46	87
Taxicab drivers and chauffeurs	161	163	171	179	5	10
Truck and tractor drivers	1,537	1,565	1,971	2,221	26	42
Welders and flame cutters	364	422	515	572	22	36
Other operatives and kindred workers	6,087	6,577	6,597	6,517	--	-1
VII. Private household workers	2,341	2,322	2,867	3,088	23	33
VIII. Service workers, except private household	6,461	6,934	9,944	12,573	43	81
Attendants, hospital and other institutions	509	559	1,033	1,519	85	172
Barbers, hairdressers, and cosmetologists	594	628	862	1,012	37	61

APPENDIX TABLE 6

Employment by Detailed Occupation, 1962, 1964 and Projected 1975 and 1985[1/]
(Number in thousands)

Occupation	1962[2/]	1964[2/]	Projected Years 1975	Projected Years 1985	Percent Change, 1964-75	Percent Change, 1964-85
VIII. continued....						
Charwomen, janitors and porters	1,049	1,160	1,598	1,978	38%	71%
Cooks	571	604	864	1,073	43	78
Firemen, fire protection	157	173	255	319	47	84
Guards, watchmen and doorkeepers	300	314	397	453	26	44
Policemen, sheriffs and marshalls	317	359	580	775	62	116
Practical nurses	254	287	442	564	54	97
Waiters, bartenders, and counter workers	1,216	1,302	1,893	2,386	45	83
Other service workers, except private household	1,494	1,548	2,020	2,495	30	61
IX. Farm workers	4,866	4,444	3,485	2,457	-22	-45
Farmers and farm managers	2,595	2,320	1,546	947	-33	-59
Farm laborers and foremen	2,271	2,124	1,938	1,510	-9	-29
X. Laborers, except farm and mine	3,559	3,624	4,262	4,754	18	31
XI. Total	67,846	70,357	87,655	101,090	25	44

Source and Notes:

[1/] Projections refer to moderate productivity growth estimates, i.e., GNP per manhour growing at an average annual rate of about 3.0 percent over the next two decades. Alternative projections for the rapid productivity growth estimates are presented in Table 7.

[2/] From unpublished Current Population Survey data, U. S. Department of Labor.

NOTE: Detail may not add to totals due to rounding.

APPENDIX TABLE 7

Employment by Detailed Occupation, 1964 and Alternative Projections for 1985[1]
(Number in thousands)

Occupation	1964[2]	Projected 1985	Percent Change, 1964-1985
I. Professional, technical and kindred workers	8,550	16,859	97%
Accountants and auditors	572	758	33
Airplane pilots and navigators	28	90	221
Architects	36	58	61
College Presidents, Professors and Instructors	231	402	74
Dentists	87	160	84
Designers and Draftsmen	308	545	77
Engineers	1,059	2,322	119
Lawyers and judges	258	390	51
Librarians	112	225	101
Natural scientists	191	416	118
Nurses, professional	592	1,151	94
Personnel and labor relations workers	123	196	59
Pharmacists	124	166	34
Physicians and surgeons	246	404	64
Social, welfare and recreation workers	215	490	128
Teachers, elementary	1,067	1,793	68
Teachers, secondary	677	955	41
Technicians, electrical and electronic	125	758	506
Technicians, medical and dental	189	534	183
Technicians, other	280	1,360	386
Other professional and technical workers	2,030	3,686	82

APPENDIX TABLE 7

Employment by Detailed Occupation, 1964 and Alternative Projections for 1985[1]
(Number in thousands)

Occupation	1964[2]	Projected 1985	Percent Change, 1964-1985
II. Managers, officials and proprietors, except farm	7,452	10,584	42%
Salaried managers	4,296	7,400	72
Self-employed	3,156	3,184	1
III. Clerical and kindred workers	10,667	17,425	63
Bookkeepers	1,152	1,628	41
Cashiers	606	1,167	93
Office machine operators	418	1,222	192
Secretaries, stenographers and typists	2,725	4,407	62
Shipping and receiving clerks	358	431	20
Stock clerks and storekeepers	400	785	96
Telephone operators	352	387	10
Other clerical workers	4,656	7,398	59
IV. Sales workers	4,456	5,583	25
Insurance and real estate agents and brokers	587	677	15
Salesmen and sales clerks, retail trade	2,635	3,184	21
Salesmen and sales clerks, other	1,234	1,722	40
V. Craftsmen, foremen, and kindred workers	8,986	11,494	28
Brickmasons, stonemasons and tilesetters	195	221	13
Cabinetmakers and pattern makers	98	72	-27
Carpenters	828	786	-5

APPENDIX TABLE 7

Employment by Detailed Occupation, 1964 and Alternative Projections for 1985[1]

(Number in thousands)

Occupation	1964[2]	Projected 1985	Percent Change, 1964-1985
V. continued....			
Cranemen, derrickmen and hoistmen	140	162	16%
Electricians	368	498	35
Excavating, grading, and road machinery operators	272	401	47
Foremen	1,237	1,609	30
Linemen and servicemen, telegraph, telephone and power	348	366	5
Locomotive engineers	57	60	5
Machinists and job setters	476	567	19
Mechanics and repairmen, automobile	758	1,197	58
Mechanics and repairmen, other	1,466	2,186	49
Painters, construction and maintenance	425	471	11
Plumbers and pipefitters	304	378	24
Printing craftsmen	341	314	-8
Stationary engineers	180	172	-4
Tinsmiths, coppersmiths, and sheet metal workers	131	139	6
Toolmakers, diemakers and setters	200	226	13
Other	1,162	1,669	44

APPENDIX TABLE 7

Employment by Detailed Occupation, 1964 and Alternative Projections for 1985[1/]
(Number in thousands)

Occupation	1964[2/]	Projected 1985	Percent Change, 1964-1985
VI. Operatives and kindred workers	12,924	15,243	18%
Assemblers	654	702	7
Attendents, auto service and parking	414	889	115
Brakemen and switchmen, railroad	117	110	-6
Bus drivers	174	207	19
Deliverymen and routemen	598	1,067	78
Checkers and inspectors, manufacturing	537	595	11
Filers, grinders and polishers, metal	179	156	-13
Laundry and dry cleaning operatives	388	410	6
Mine operatives and laborers	208	60	-71
Painters, except construction and maintenance	132	146	11
Sewers and stitchers, manufacturing	794	1,465	85
Taxicab drivers and chauffeurs	163	187	15
Truck and tractor drivers	1,565	2,264	45
Welders and flame cutters	422	550	30
Other operatives and kindred workers	6,577	6,435	-2
VII. Private household workers	2,322	3,072	32
VIII. Service workers, except private household	6,934	12,903	86
Attendants, hospital and other institutions	559	1,535	175
Barbers, hairdressers, and cosmetologists	628	1,032	64

APPENDIX TABLE 7

Employment by Detailed Occupation, 1964 and Alternative Projections for 1985[1]
(Number in thousands)

Occupation	1964[2]	Projected 1985	Percent Change, 1964-1985
VIII. continued....			
Charwomen, janitors and porters	1,160	2,013	74%
Cooks	604	1,110	84
Firemen, fire protection	173	335	94
Guards, watchmen and doorkeepers	314	490	56
Policemen, sheriffs and marshalls	359	813	126
Practical nurses	287	594	107
Waiters, bartenders, and counter workers	1,302	2,477	90
Other service workers, except private household	1,548	2,504	62
IX. Farm workers	4,444	2,407	-46
Farmers and farm managers	2,320	928	-60
Farm laborers and foremen	2,124	1,479	-30
X. Laborers, except farm and mine	3,624	4,190	16
XI. Total	70,357	99,760	42

[1] Refer to rapid productivity growth estimates, i.e., GNP per manhour growing at an average annual rate of about 3.6 percent over the next two decades.

[2] From unpublished Current Population Survey data, U. S. Department of Labor.

NOTE: Detail may not add to totals due to rounding.

Increase in Manpower Requirements Between 1964 and 1975 and Level of Education and Training Requirements, by Detailed Occupation (Number in thousands)

Occupation	1964[1/] (No. Employed)	Increase in Number 1964-1975	Percent Increase, 1964-1975	Years of Educational Attainment in 1975[2/]	Years of Vocational Training Requirement[3/]
I. Professional, technical and kindred workers	8,550	3,863	45%	16.4	4.0
Accountants and auditors	572	160	28	14.7	7.0
Airplane pilots and navigators	28	31	111	13.7	1.5
Architects	36	14	39	17.6	7.0
College Presidents, Professors and Instructors	231	65	28	18.3	7.0
Dentists	87	30	34	18.2	7.0
Designers and Draftsmen	308	136	44	13.1	3.0
Engineers	1,059	530	50	16.6	7.0
Lawyers and judges	258	79	31	18.2	7.0
Librarians	112	43	38	17.1	3.0
Natural scientists	191	89	47	17.7	3.0
Nurses, professional	592	250	42	13.5	3.0
Personnel and labor relations workers	123	47	38	15.1	7.0
Pharmacists	124	21	17	16.9	3.0
Physicians and surgeons	246	63	26	18.5	7.0
Social, welfare and recreation workers	215	115	53	17.2	3.0
Teachers, elementary	1,067	177	17	17.8	1.5
Teachers, secondary	677	154	23	18.3	3.0
Technicians, electrical and electronic	125	258	206	12.7	3.0
Technicians, medical and dental	189	89	47	13.2	3.0
Technicians, other	280	411	147	12.8	3.0
Other professional and technical workers	2,030	1,101	54	16.0	3.0

APPENDIX TABLE 8

Increase in Manpower Requirements Between 1964 and 1975 and Level of Education and Training Requirements, by Detailed Occupation (Number in thousands)

Occupation	1964 1/ (No. Employed)	Increase in Number 1964-1975	Percent Increase, 1964-1975	Years of Educational Attainment in 1975 2/	Years of Vocational Training Requirement 3
II. Managers, officials and proprietors, except farm	7,452	1,954	26%	12.9	2.3
Salaried managers	4,296	2,231	52	13.6	3.0
Self-employed	3,156	-277	-9	12.6	0.8
III. Clerical and kindred workers	10,667	4,046	38	12.5	0.6
Bookkeepers	1,152	345	30	12.5	0.4
Cashiers	606	309	51	12.2	0.4
Office machine operators	418	355	85	12.5	0.2
Secretaries, stenographers and typists	2,725	1,088	40	12.6	1.5
Shipping and receiving clerks	358	51	14	11.9	0.2
Stock clerks and storekeepers	400	209	52	12.1	0.2
Telephone operators	352	14	4	12.3	0.2
Other clerical workers	4,656	1,675	36	12.5	0.4
IV. Sales workers	4,456	827	19	12.3	1.1
Insurance and real estate agents and brokers	587	87	15	12.8	1.5
Salesmen and sales clerks, retail trade	2,635	393	15	12.1	0.8
Salesmen and sales clerks, other	1,234	347	28	12.4	1.5
V. Craftsmen, foremen, and kindred workers	8,986	1,736	19	12.0	4.1
Brickmasons, stonemasons and tilesetters	195	30	15	11.1	3.0
Cabinetmakers and pattern makers	98	-9	-9	12.1	3.0
Carpenters	828	21	3	10.9	7.0

APPENDIX TABLE 8

Increase in Manpower Requirements Between 1964 and 1975 and Level of Education and Training Requirements, by Detailed Occupation (Number in thousands)

Occupation	1964[1/] (No. Employed)	Increase in Number 1964-1975	Percent Increase, 1964-1975	Years of Educational Attainment in 1975 [2/]	Years of Vocational Training Requirement [3/]
V. continued....					
Cranemen, derrickmen and hoistmen	140	21	15%	10.2	3.0
Electricians	368	73	20	12.2	7.0
Excavating, grading, and road machinery operators	272	93	34	10.6	0.8
Foremen	1,237	263	21	12.2	7.0
Linemen and servicemen, telegraph, telephone and power	348	19	5	12.4	3.0
Locomotive engineers	57	5	9	11.8	3.0
Machinists and job setters	476	72	15	12.1	3.0
Mechanics and repairmen, automobile	758	174	23	11.3	3.0
Mechanics and repairmen, other	1,466	403	27	12.1	3.0
Painters, construction and maintenance	425	42	10	10.5	3.0
Plumbers and pipefitters	304	70	23	11.7	3.0
Printing craftsmen	341	-23	-8	12.3	7.0
Stationary engineers	180	37	21	12.5	3.0
Tinsmiths, coppersmiths, and sheet metal workers	131	6	5	12.1	3.0
Toolmakers, diemakers and setters	200	31	16	12.2	3.0
Other	1,162	408	35	11.4	3.0

Increase in Manpower Requirements Between 1964 and 1975 and Level of Education and Training Requirements, by Detailed Occupation (Number in thousands)

Occupation	1964[1] (No. Employed)	Increase in Number 1964-1975	Percent Increase, 1964-1975	Years of Educational Attainment in 1975[2]	Years of Vocational Training Requirement[3]
VI. Operatives and kindred workers	12,924	1,636	13%	11.1	0.5
Assemblers	654	43	7	11.0	1.5
Attendents, auto service and parking	414	263	64	11.5	0.04
Brakemen and switchmen, railroad	117	8	7	11.8	0.4
Bus drivers	174	20	11	11.4	0.8
Deliverymen and routemen	598	398	67	11.9	0.8
Checkers and inspectors, manufacturing	537	62	12	11.9	0.04
Filers, grinders and polishers, metal	179	-8	-4	11.0	0.4
Laundry and dry cleaning operatives	388	16	4	10.1	0.04
Mine operatives and laborers	208	-65	-31	10.2	0.8
Painters, except construction and maintenance	132	10	8	10.8	0.4
Sewers and stitchers, manufacturing	794	364	46	9.9	0.4
Taxicab drivers and chauffeurs	163	8	5	10.8	0.2
Truck and tractor drivers	1,565	406	26	10.7	0.4
Welders and flame cutters	422	93	22	11.2	1.5
Other operatives and kindred workers	6,577	20	--	11.1	0.4
VII. Private household workers	2,322	545	23	9.8	0.04
VIII. Service workers, except private household	6,934	3,010	43	11.7	0.6
Attendants, hospital and other institutions	559	474	85	12.1	0.2
Barbers, hairdressers, and cosmetologists	628	234	37	12.2	0.8

Increase in Manpower Requirements Between 1964 and 1975 and Level of Education and Training Requirements, by Detailed Occupation (Number in thousands)

Occupation	1964[1/] (No. Employed)	Increase in Number 1964-1975	Percent Increase, 1964-1975	Years of Educational Attainment in 1975[2/]	Years of Vocational Training Requirement[3/]
VIII. continued....					
Charwomen, janitors and porters	1,160	438	38%	10.0	0.2
Cooks	604	260	43	10.9	3.0
Firemen, fire protection	173	82	47	12.3	1.5
Guards, watchmen and doorkeepers	314	83	26	11.3	0.2
Policemen, sheriffs and marshalls	359	221	62	12.5	0.8
Practical nurses	287	155	54	12.2	0.4
Waiters, bartenders, and counter workers	1,302	591	45	11.8	0.2
Other service workers, except private household	1,548	472	30	11.2	0.4
IX. Farm workers	4,444	-959	-22	8.9	0.4
Farmers and farm managers	2,320	-774	-33	9.6	0.8
Farm laborers and foremen	2,124	-186	-9	8.7	0.04
X. Laborers, except farm and mine	3,624	638	18	10.3	0.04
XI. Total	70,357	17,298	25	12.3	1.7

[1/] From unpublished Current Population Survey data, U. S. Department of Labor.

[2/] Refer to median years of educational attainment of employed civilian labor force 14 years of age and over.

[3/] Refer to specific vocational preparation (SVP) and derived from 1965 edition of the Dictionary of Occupational Titles. No projected estimates of SVP data are available. Estimates for the major occupational groups have been derived as weighted averages of their detailed occupations in the projected 1975 employment.

NOTE: Detail may not add to totals due to rounding.

APPENDIX TABLE 9-1

Estimated Percent Distribution of Employment by Level of Educational Attainment in 1962, by Goals

Goal Area	Years of Schooling Completed					
	8 Years or less	1-3 years of high school	4 Years of high school	1-3 years of college	4 or more years of college	Total
Consumer Expenditures	30.0%	22.5%	28.0%	11.0%	8.5%	100.0%
Health and Education	19.0	16.5	22.5	14.5	27.5	100.0
Housing	33.5	23.5	27.5	9.5	6.0	100.0
International Aid	39.0	20.5	26.0	7.5	7.0	100.0
National Defense	28.0	22.5	29.0	11.0	9.5	100.0
Natural Resources	31.5	22.5	29.0	9.0	8.0	100.0
Private Plant and Equipment	30.0	22.5	29.0	10.5	8.0	100.0
Research and Development	22.0	19.0	27.0	13.0	19.0	100.0
Social Welfare	29.0	21.5	27.5	11.5	10.5	100.0
Transportation	30.0	23.5	29.0	10.0	7.5	100.0
Urban Development	31.5	23.0	28.0	10.0	7.5	100.0

APPENDIX TABLE 9-2

Estimated Percent Distribution of Employment by Level of Educational Attainment in 1975, by Goals

Goal Area	Years of Schooling Completed					
	8 Years or less	1-3 years of high school	4 Years of high school	1-3 years of college	4 or more years of college	Total
Consumer Expenditures	18.5%	21.5%	35.5%	13.0%	11.5%	100.0%
Health and Education	11.5	14.5	29.0	14.5	30.5	100.0
Housing	21.5	22.5	36.5	11.0	8.5	100.0
International Aid	23.5	19.0	36.0	11.0	10.5	100.0
National Defense	16.5	19.0	36.5	14.0	14.0	100.0
Natural Resources	19.0	20.5	36.0	12.0	12.5	100.0
Private Plant and Equipment	18.5	20.5	37.0	13.0	11.0	100.0
Research and Development	13.5	16.5	33.5	15.0	21.5	100.0
Social Welfare	17.5	20.0	34.5	13.0	15.0	100.0
Transportation	19.5	22.0	37.0	12.0	9.5	100.0
Urban Development	20.5	22.5	35.5	12.0	9.5	100.0

Table 10-1

Estimated Distribution of Employment by Specific Vocational Preparation Category, in 1962, for Individual Goals

Goal Area	Up to 3 months (1)	Over 3 months and up to 1 year (2)	Over 1 year and up to 2 years (3)	Over 2 years and up to 4 years (4)	Over 4 years (5)	Total
Consumer Expenditures	22.5%	43.0%	7.0%	21.5%	6.0%	100.0%
Health and Education	15.6	24.0	17.0	35.5	8.5	100.0
Housing	17.0	31.5	8.0	27.0	16.5	100.0
International Aid	24.5	43.5	8.5	17.5	6.0	100.0
National Defense	14.5	32.0	12.5	26.5	14.5	100.0
Natural Resources	20.0	35.5	8.0	28.0	8.5	100.0
Private Plant and Equipment	15.0	35.5	11.5	25.5	12.5	100.0
Research and Development	11.0	29.5	9.5	32.0	18.0	100.0
Social Welfare	21.5	39.0	9.0	24.5	6.0	100.0
Transportation	14.5	34.0	11.5	33.0	7.0	100.0
Urban Development	16.0	34.5	8.0	27.5	14.0	100.0

Table 10-2

Estimated Distribution of Employment by Specific Vocational Preparation Category, in 1975, for Individual Goals

Goal Area	Up to 3 months (1)	Over 3 months and up to 1 year (2)	Over 1 year and up to 2 years (3)	Over 2 years and up to 4 years (4)	Over 4 years (5)	Total
Consumer Expenditures	22.0%	40.0%	7.0%	24.5%	6.5%	100.0%
Health and Education	16.0	22.0	17.0	36.5	8.5	100.0
Housing	16.0	30.5	8.0	29.0	16.5	100.0
International Aid	18.5	40.0	9.0	23.5	9.0	100.0
National Defense	14.5	27.5	11.5	29.0	17.5	100.0
Natural Resources	18.0	31.0	7.5	32.0	11.5	100.0
Private Plant and Equipment	13.0	33.0	11.5	29.0	13.5	100.0
Research and Development	10.0	26.5	9.0	35.5	19.0	100.0
Social Welfare	20.5	37.0	8.5	28.0	6.0	100.0
Transportation	13.5	33.0	12.0	33.5	8.0	100.0
Urban Development	14.5	33.5	8.0	30.0	14.0	100.0

Educational Change for Manpower Development

by

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Working Paper

for

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"To provide an education adapted to the years, the capacity, and the condition of everyone, and directed to their freedom and happiness"

Thomas Jefferson
Virginia Papers, 1781-85

EDUCATIONAL CHANGE FOR MANPOWER DEVELOPMENT

Within the framework of a matrix of change this paper will study some issues pertaining to education's response to certain economic and social demands. Not unlike other observers of a dynamic culture, educators with the cooperation and often the coercion of other segments of society are directing their efforts to all aspects of the educational process. This investigation will concentrate on one important aspect - namely, the contribution of vocational development to the individual and to the development of an effective labor force.

A more specific goal will be to address ourselves to the vocational needs of the rural and urban poor, the socially and economically disadvantaged, or those threatened with deprivation in an age of affluence and increasing educational opportunity. The position of the National Education Association on this issue has been clearly stated. (1)

"Students among the disadvantaged or culturally deprived need school

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(1) National Education Association, Schools for the Sixties. New York: McGraw Hill Book Company, 1963, pp. 112-113.

> programs that stress basic skills, relate school experience to work experience and help to make up for cultural deficiencies. It is important, however, that these students not be treated intellectually as second-class citizens. The great challenge here is a two-fold one: first, to develop a program meaningful to these young people, a task which needs much study in depth and which must be tailor-made, in many respects, to each community; second, to relate the school program to employment opportunities."

Rapid technological and scientific changes, a population explosion, increasing concern for the rights and privileges of individuals, a shrinking world and universe as horizons by faith become sensory realities, expanding national states with attending frustrations and satisfactions have all made modern man suddenly aware of a need to update his thinking, feelings and institutions, to change--hopefully, planned and rational change.

What are some consequences of certain educational policy decisions made in 1968 as the schools interact with an impatient, sometimes critical, lay public - consumers of the educational product? Insightful decision making is indicated as problems tumble over each other.

By insight modern man lives in three periods of time simultaneously. His perception of time is related to many experiences, one of which is his perception of problems, needs, imbalances, inharmony. The degree of effectiveness to which "present"problems are solved is dependent upon the degree that past learning and future goals can be related to present needs.

In ten short packed years the consequences of some hasty policy decisions made then, without benefit of careful planning, without studying to error.

The first policy issue to be examined will be equal employment and educational opportunity. If one of America's goals is to provide better qualified workers for a more viable economy, selection policies need to be explored as alternatives to some currently proposed, such as longer training programs, more student aid, improved equipment and facilities, and more financial support for research and development. There is evidence which suggests that extrinsic criteria of sex and race receive more weight than the use of researched qualification standards receive in the selection of students and workers. Profiles of worker trait requirements in the Dictionary of Occupational Titles do not make reference to age, sex or race. This is not to imply that other goals, such as individual fulfillment and other approaches to a more effective labor force are less worthy of consideration, but the educational response to manpower demand is the principal focus of this study.

It should not be necessary in a country committed for over 100 years to a policy of universal education to imply that opportunities are not available to some, or that some are more educable than others. Various degrees of opportunity do exist to the point where relevant inquiries can be made. If the school provides the same buildings, the same teachers, and the same courses to all children and youth up to the compulsory school age, and the student does not take advantage of it, is the school privileged to "drop" him? If language barriers and social backgrounds handicap a child's progress to the point of failure, is that child receiving an equal opportunity? Do all students have the right to fail algebra or a foreign language? Is it to the student's advantage,regardless of ability, to be taught an academic course because more able students who take an academic course go on to college than those who do not? (Correlation without causation.)

The National Education Association Project on Instruction (4) repeated an objective of public education which is almost axiomatic.

> "The people of this country have committed themselves to the proposition that all children and youth in the United States shall be educated; therefore, the instructional program should provide: (a) opportunities for developing the individual potentialities represented in the wide range of differences among people; (b) a common fund of knowledge, values, and skills vital to the selfare of the individual and the nation."

Miller and others have called our attention to certain discrepancies. (5) They refer to a Syracuse University study of school expenditures by Campbell and others showing that in 1962, of 35 of the largest metropolitan areas, expenditures in the central cities was $145 per pupil less than in their contiguous suburbs where there are few children of lower income families. Even more disconcerting, the gap between cities and suburbs is growing. The 1962 difference did not exist in 1958.

Data for the city of Detroit in the late 1950's showed that for children in families in the 'below $7,000 income' category, 18 percent of the total teaching time was by "emergency substitutes in regular positions" as compared with 5.5 percent for children in families with 'above $7,000 family incomes'.

Discrimination by race and sex have been legally legislated out of existence but few would deny that it is still practiced. (See papers by Burnett and Ruth.) The Equal Employment Opportunities Commission, according to Denniston, (6) has a backlog of about 1800 complaints, 79.2 percent of which, for the year ending June 30, 1967, cite employers.

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(4) Op. cit., National Education Association, 1963, pp. 28-29.

(5) S. M. Miller, "Poverty, Inequality, and Conflict", The Annals, Volume 373, September, 1967.

The non-white workers are expected to make greater gains between 1964 and 1975 than the white workers in some classifications (appendix table, Park paper), but they will be insignificant. The non-white group will show a larger rate of increase in the total labor force than whites, 34 and 23 percent respectively, but the rate of increase will be less for aspiration goals. It will be noted that rates of gains for the non-whites will exceed the whites for white collar workers as a group, professional workers, clerical and sales workers, but less than whites for "other service workers". In occupational groups where rates of increase will decrease by 1975, the rate for non-whites will decrease less than whites for blue collar workers; laborers and operatives, scarcely a gain. No differences are expected for managers, and the gains for whites as service workers will be greater than non-whites. However, the percent of non-white workers in service jobs will remain about one-third of their total labor force participation as compared with one-eighth for white workers, and in white collar occupations, white workers will maintain a 2:1 advantage in 1975.

The problem of discrimination is serious, but in terms of labor force needs, discrimination against women is more widespread. Because of custom and tradition, women are seldom employed in 109 of the 165 detailed occupations with over 100,000 employed workers in each. (7) More than half of these detailed occupations with few females, 57, were classified under the craftsmen, operatives, or laborer headings. Twenty of the major occupations under the heading "Managers, Officials and Proprietors (except farm)" were predominantly male occupations. There seems to be little rationality to the virtual exclusion of women from occupations such as the following: accountants and auditors, clergymen, draftsmen, civil engineers, lawyers, judges, physicians, technicians in engineering and physical sciences, mail carriers, postal clerks, stock clerks and store-keepers, insurance agents, brokers, and underwriters, compositors and typesetters. Each of these occupations included 100,000 or more employed workers but less than 10 percent of them were female workers.

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(6) Lyle Denniston, "Tougher Legal Action is Planned Against Bias", A special report, Evening Star, Washington, D. C., October 9, 1967.

(7) U.S. Census of Population: 1960, Occupational Characteristics, Final Report PC (2) - 7A, Washington, D.C., U.S. Government Printing Office, 1963, Table 3.

It will be noted from table 1 that among the 15 high increase occupational groups (50 percent or more increase between 1964 and 1975) over half of the workers in 5 of 15 occupations will be women.

The status of women in American culture and in the labor force is an enigma in many respects. Stereotyping is a dangerous past-time, but sociologists and anthropologists characterize girls as aspiring to marriage as a primary life style. The masculine life style is, or has been, work centered. The participation rate of women in the labor force has been increasing steadily and it is expected to increase. At the same time they have been marrying earlier and raising more children.

Women have been expected and even encouraged to enter the labor force during the past two generations, but employment policies have continued to be discriminatory. The median wage or salary of white males, 1964, was $6497 and for white females, $3859; for non-white males, it was $4285 and for non-white females,

TABLE 1

HIGH-INCREASE OCCUPATIONS BY SEX AND RACE
1975 PROJECTIONS (in 000)

OCCUPATION	NOS. BY SEX		PERCENT FEMALE	WHITE	NON-WHITE	PERCENT NON-WHITE OF TOTAL
	MALE	FEMALE				
Salaried Managers	5,550	977	15	6,351	176	2.70
Other Professions	2,189	940	30	2,912	218	6.96
Engineers	1,584	5	0.3	1,560	31	1.95
Electronic Technicians	377	6	16	366	14	3.66
Other Technicians (Exc. Med. & Dental)	581	110	11	669	25	3.62
Pilots	59	0	0	59	0	0
Cashiers	135	780	85	860	54	5.90
Stock Clerks	499	110	18	526	83	13.63
Office Machine Operators	249	524	68	721	52	6.73
Social, Welfare, Recreation Workers	150	180	55	270	59	17.88
Practical Nurses	18	424	96	367	75	16.97
Hosp. Attendants	196	837	81	741	292	28.27
Parking Attendants	669	8	1	571	107	15.81
Routemen	976	20	2	879	114	11.45
Policemen	565	15	3	545	35	6.03
Total	14,776	3,959	21	17,397	1,335	7.13

$2674, (8) and the gap is widening. Since 1956, men's median salaries have increased 38 percent and women's 30 percent.

If professional and technical occupations continue to be in critical demand, it would be expected that a consequence of a policy of balancing supply and demand would find over 6 percent of doctors would be female and that over 8 percent of all those listed in the National Register of Scientific and Technical Personnel would be female.

One profession that has a major responsibility for occupational adjustment is counseling and guidance and yet women are seriously discriminated against. A study of numbers in the American School Counselors Association by Lawlor (9) revealed an even distribution of counselors by sex, 52 and 48 percent, but men's salaries were 6.7 percent higher; more women had master's degrees, and more men became administrators and counselor educators than women.

Inconsistencies between the sexes in labor force participation and cultural conflicts between the sexes, and among them separately, raise serious policy questions.

> "Some might question whether it is appropriate to place special emphasis on women. Those who question may feel women should be entering more occupations and therefore, want less emphasis on the fact that certain occupations are, in a sense, identified with the feminine sex. Others who raise questions feel that more men should be entering the fields now identified as the domain of women and therefore, are also concerned with any emphasis that would lead to the continued identification of these occupations with women. Both of these arguments may have validity.

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(8) U.S. Department of Labor, Women's Bureau, 1965 Handbook on Women Workers, Washington Government Printing Office, 1966, p. 130.

(9) Patricia M. Lawlor, "The School Counselor: the Person and the Profession", unpublished doctoral dissertation, George Washington Univ., 1967.

> Still others question whether it is appropriate to encourage women to work outside the home. With 35 percent of the labor force composed of women and 37 percent of women 14 years and older in the labor force, the argument of whether women should be prepared for employment does not seem in keeping with the realities of the times." (10)

A most obvious policy decision to eliminate employment discrimination would be to practice a current policy of hiring qualified applicants. Employers are partially right when they assert that many women are not qualified for many jobs, but the circle of prejudice has already run its course as evidenced by the disproportionate percent of women in training for jobs that have no physical limitations. Men do not have a monopoly on eye - hand coordination and space relations, but practically no women become repairmen and mechanics (except during World War II when they were needed!).

Relative enrollments by sex in vocational education programs would appear to reflect factors unrelated to qualifications and occupational requirements. According to a U.S. Office of Education report, (11) "52.9 percent of vocational students are women but their enrollments by course vary as follows: Home Economics - 96.7, Health Occupations - 95.3, Office Occupations - 76.8, Distributive Education - 42.3, Trade and Industrial - 10.7, and Technical - 8.7 percent".

The consequences of a policy to train and hire "workers", or to train "students", rather than "men or women" or "whites or non-whites" could be reasonably expected to reduce discrimination by 50 percent. The emotional and traditional

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(10) Center for Vocational and Technical Education, Implications of Women's Work Patterns for Program Development in Vocational and Technical Education, Columbus, The Ohio State University, 1967, p. 1.

(11) U.S. Office of Education, "Preliminary Report on Fiscal 1966 Enrollment Figures", 1967.

limitations of sex and color could well be eliminated semantically by using a neutral term of "student" or "worker". Prejudice against handicapped workers has been greatly reduced by stressing the qualifications of the applicant rather than their disabilities.

The consequences of another policy decision regarding the training and employment of women could conceivably affect major changes in education, the labor force and social patterns. A permissive policy that respects a basic desire of women to identify with institutions of marriage, the home and non-wage productive activities rather than with employment and the labor force deserves examination. If the assumption is valid that discrimination against women in the labor force is due to the inability of men to accept their competition, removing women from a competitive position would help allay the social and psychological problem at least. Furthermore, the consequences of a shortened work week * and the threat of a reduction of the labor force due to technological advances would reduce much of the insecurity prevalent among workers today. There is also evidence that occupational shortages are not as critical as they were five years ago. If the nation does not choose to pursue goals other than space and defense, critical manpower needs will not exist; thus, reducing the possibility of increasing competition between the sexes, and releasing women from conflict choices.

A policy which would permit women a free choice between work - no-work could conceivably resolve many of the social and employment problems of both women and men. An evaluation of a current policy to coerce women to choose two careers might suggest alternative routes to an adequate work force and to improved personal and social relationships.

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* If the concept of work as the determiner of one's style of life changes, leisure might become more acceptable and hence, the shortened work week would be removed as a threat.

THE RELATIONSHIP BETWEEN EDUCATION AND MANPOWER DEMAND IN 1975

Economic, social and school planners have, since 1960, made decisions based on certain assumptions supported in part by research evidence that manpower and individual needs for optimum development are related positively and significantly to the quantity and quality of education. It is not within the scope of this study to examine the relationship between quality of education and labor force demands. An attempt will be made to examine a popular assumption that technical and scientific improvements require corresponding increases in the amount of education.

Manpower demands from economic changes have been presented in the Park paper. It has been noted that expected differences in rates of increase for 90 occupations between 1964 and 1975 * will vary considerably, from -33 percent to 206 percent. To test some hypotheses regarding the relationship between education and manpower changes, it was decided to examine the occupations showing the greatest rate of increase. An increase of 50 percent was abitrarily selected, double the projected 25 percent rate of increase for the total work force. It will be noted from tables 2 and 3 that fifteen of the 90 occupations met the 50 percent criterion.

To relate numbers of workers to rate of increase meaningfully (column 4), both dimensions were converted into deciles. Of the 90 occupational groups, farmers and farm managers, show a loss of 33 percent, and Electronics Technicians

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* Using a benchmark estimate of a 4.5 percent in GNP. See appendix table, Park paper.

TABLE 2

HIGH INCREASE OCCUPATIONS ---- 1975 PROJECTIONS (IN 000)

OCCUPATION	TOTAL NO.	% INCREASE 1964-1975	RATIO, NOS. TO % (Deciles)	TRAINING		
				ATTAINMENT	GED	SVP
Salaried Managers	6,527	52	7:5	13.6 Gr.	5	7
Other Professions	3,131	54	4:5	16.0 "	5	8
Engineers	1,589	50	3:5	16.6 "	6	8
Electronic Technicians	383	206	1:10	12.7 "	4	7
Other Technicians (Exc. Med & Dental)	691	147	2:8	12.8 "	5	7
Pilots	59	111	1:7	13.7 "	5	6
Cashiers	915	51	2:5	12.2 "	3	4
Stock Clerks	609	52	2:5	12.1 "	3	3
Office Machine Operators	773	85	2:6	12.5 "	3	3
Social, Welfare Recreation Workers	330	53	1:5	17.2 "	5	7
Practical Nurses	442	54	1:5	12.2 "	3	4
Hosp. Attendants	1,033	85	3:6	12.1 "	3	3
Parking Attendants	677	64	2:5	11.5 "	2	2
Routemen	996	67	2:5	12.1 "	4	5
Policemen	580	62	2:5	12.5 "	3	5
Total	18,735 *			12.3 "		

* 21 percent of total labor force.

TABLE 3

DISTRIBUTION OF 90 OCCUPATIONAL GROUPS BY 1975 PROJECTIONS OF NUMBERS AND BY RATE OF INCREASE OVER 1964 (IN DECILES)

1975 Projections by Occupation (in Millions) *	RATE OF INCREASE, 1964 - 1975 (In Percent)										
	1 -25 & Below	2 0 to -24	3 0-- 24	4 25-- 49	5 50-- 74	6 75-- 99	7 100- 124	8 125- 149	9 150- 174	10 Over 174	T
10. 11.5 and over			1**	1							2
9. 10.0 to 11.4			1	1							2
8. 8.5 to 9.9				2							2
7. 7.0 to 8.4											
6. 5.5 to 6.9			1	1	1						3
5. 4.0 to 5.4			2								2
4. 2.5 to 3.9		1&1	2	1	1						6
3. 1.0 to 2.4	1		3	9	1	1					15
2. 0.5 to 0.9			8	4	5	1		1			19
1. 0.0 to 0.4	1	3	18	13	2		1			1	39
Total	2	5	36	32	10	2	1	1		1	90

* Manpower projections for 1975 are benchmark estimates based on a 4.5 percent annual GNP increase.

** Groups of occupations as opposed to single occupations are underscored.

an increase of 206 percent making the value of each decile interval 25 percent, -25 to -49 percent decile "1" and 175 percent and over, decile "10". The numbers of workers range from 50,000 architects to 14,713,000 for clerical workers. Ten intervals of 1.5 million each would have covered the total range. However, most occupations will have less than one million. To spread them out, the first two "decile" intervals will include only 0.5 million workers, and the balance 1.5 million, (table 3).

For curriculum planning and vocational guidance, table 2 shows the ratio of numbers to rate of increase. Electronic technicians is in the 10 decile on rate, but in the first on numbers. On the other hand, salaried managers will increase relatively slowly for the high increase group, but there will be a very large number of opportunities. *

The fifteen high increase occupations are related to the total labor force as follows:

6,527,000 will be salaried managers, or 7.5 percent of total labor forces, or 13.9 percent of the total of fifteen high increase occupations.

3,131,000 "other professions", or 3.6 percent of total labor force (25 percent of all "professional, technical and kindred workers").

2,722,000 engineers, electronics technicians, other technicians and

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* Salaried managers is generally considered to be a category into which one is promoted as opposed to qualifying through training.

pilots, or 3.1 percent of total labor force.

2,297,000 cashiers, clerks, office machine operators or 2.6 percent.

2,253,000 parking lot attendants, routemen and policemen, or 2.6 percent.

1,805,000 social, welfare, recreational workers; hospital attendants and practical nurses, or 2.1 percent.

Training Time Component

There are two systems for reporting educational requirements: (1) the median level of educational attainment experience by occupation obtained from census reports, and (2) educational requirements from job analyses as reported in the Department of Labor, Worker Traits Requirements, DOT, Volume II. The first one suggests to a learner the kind of educational competition he faces if he wishes to prepare for a certain occupation. The second says that if one qualifies for entering training, he will need X amount of training for successful performance on the job.

Both systems imply a certain amount of general education and special vocational training. The total amount under the first system may or may not be related to job requirements. The employer's standards and the individual's wishes may increase the total amount. The job analysis system used in the DOT reports minimum amounts. Table 2, column 6, codes the training time necessary for General Education Development (GED) defined (12) in six levels of difficulty for three areas.......Reasoning, Mathematical and Language Development. Recently the six levels have been translated into grade level attainment: 1 -- 3rd, 2 -- 6th, 3 -- 9th, 4 -- 12th, 5 -- 14th to 16th years and 6 -- 16 years and over.

The DOT system also reports Special Vocational Development (SVP). SVP refers to the amount of time in a school, work, military, institutional or a vocational environment to learn the techniques, acquire information and develop the facility needed for average performance. The various levels of SVP are coded from 1, short demonstration only, through 4, over 3 months to and including 6 months, and up to 9, over 10 years.

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(12) DOT, Part II, pp. 651-652.

Returning to the educational attainment technique, it should be noted that the Census Bureau figures recorded in table 4 are based on a labor force age of fourteen and over. The attainment column reported by the Department of Labor for 1962 is based on a labor force of eighteen years of age and over.

It will be noted that the attainment level increase between 1962 and 1975 varies by occupational group and the number of years of educational attainment. The professional and technical category is projected to increase by 0.3 years, but clerical and sales groups by only 0.1 year. On the other hand, large increases are expected for craftsmen, 1.4 years; operatives, 1.3 years; service workers, 1.5 years; and laborers by 1.5 years.

The attainment level for the total labor force is expected to increase 0.6 years by 1975. What are the implications of such a trend?

1. An obvious one is that a high school student planning his education and career would have to plan on graduating from high school to have a 50-50 chance of competing in the labor force as far as the training component is concerned.
2. Clerical and sales occupations have reached a plateau on educational

TABLE 4

EDUCATIONAL ATTAINMENT

MAJOR OCCUPATIONAL GROUP	1962		1975
	Census Bureau	Manpower Report	NPA Projections
Professional, technical and kindred workers	16.1	16.2 *	16.4
Managers, officials and proprietors, except farm	12.5	12.5	12.9
Clerical and kindred workers	12.4	12.5	12.5
Sales workers	12.2	12.5	12.3
Craftsmen, foremen, and kindred workers	10.6	11.3	12.0
Operatives and kindred workers	9.8	10.2	11.1
Private household workers	8.7	8.9	9.8
Service workers, except private household	10.2	11.0	11.7
Farm workers	8.6	8.8	8.9
Laborers, except farm and mine	8.8	9.4	10.3
Total	11.7	12.1	12.3

* Median years completed by employed civilian labor force 18 years of age and over, as of March, 1962 (1967 Manpower Report).

requirements.

3. Employment qualifications other than education would be more significant than educational attainment judging from a greater increase in education for occupations that require less training. For example, laborers will have on the average 1.5 more years of education in 1975 than 1962, while professional and technical occupations will increase only 0.3 years. Are the projected differences related to employment policies other than training requirements?

4. Even with the large increases in educational attainment projected for occupations in which the average worker will not be a high school graduate, 40 percent of the job opportunities will be in such occupations. However, among the 15 high increase occupations (table 2), only one, parking attendants, will have a median educational attainment of less than high school graduation. But the worker trait profiles, coded in the DOT, Vol. II, show that seven of the fifteen high increase occupations (table 2) require less than twelve years of training (a GED of 3, or 9 years, plus no more than one year of specialty training, code 5 or less), cashiers, stock clerks, office machine operators, practical nurses, hospital attendants, parking attendants, and policemen. The total number of workers in these seven areas in 1975 (benchmark estimates) will be about 5,029,000 or 27 percent of all workers in the high increase occupational groups.

Characteristics of trends in educational attainment and requirements as related to demand occupations (high increase) (table 2) raise some issues relative to claims made for increasing training time.

1. Only engineers require a college degree (translation from DOT, code 5

in GED, General Education Development) with four or more years of SVP, Special Vocational Preparation (not to be interpreted as training in addition to a college degree).

2. Salaried managers, other professions, other technicians, pilots, social workers require some college preparation. These five high-increase occupations constitute 57 percent of the high-increase total, and 12 percent of the total labor force. The balance of the high-increase occupations, approximately 35 percent of workers in demand occupations require only high school graduation or less with two years or less of vocational preparation, and this requirement can be met during the secondary school years.

3. NPA's projected educational attainment by occupation (table 13)* indicates that 51 percent of the labor force (age 14 and over) will have had less than a high school education (blue collar, service and farmer categories) although 6.4 percent of blue collar workers will have had 1-3 years of college and 1.3 percent will be college graduates. Among the farmer group, 4.1 percent will have had 1-3 years of college and 2.3 percent will be graduates.

4. The preceding evidence of an overemphasis on vocational preparation time corroborates a position taken in the President's Manpower Report, 1967.(13)

"The skill shortages which emerged at the end of 1965 and which have prevailed in the economy during the past year have not been great enough to impede the production of goods significantly. However, production schedules have sometimes been delayed because the requisite numbers of skilled workers were not readily available. And, though the provision of needed services has seldom been interrupted, manpower shortages in the fields of health, education, and social welfare have restricted the services available in many local areas - particularly for disadvantaged people."

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* See paper by Park.

(13) U. S. Department of Labor, Manpower Report of the President, Washington, D.C., U. S. Printing Office, 1967, p. 149.

Skill shortages have been a function of both supply and demand, according to the President's Manpower Report, 1967. During the early phase of the current economic expansion in 1961, the labor force with 7 percent unemployed permitted employers to hire fully qualified workers. However, beginning in late 1965, as the unemployment rate declined below 4 percent, an adequate supply of qualified workers was no longer available. If large numbers of military personnel return to civilian life, the 1961-type situation would return providing no effort were made to place high priorities on achieving some of the national goals held in abeyance during recent years.

Contrary to an inference that may have been drawn from the above that high priority occupations of the past few years be removed from the demand list, it would be more realistic to strengthen and add other occupations to the demand list, such as health, welfare, recreation, art.

Individual needs would be served more completely with more alternative choices and, furthermore, a higher status value would be placed on them, an essential for motivating choice.

LEARNING APTITUDE

Another aspect of the relationship between education and employment is the relationship between educational requirements for present high demand occupations in the professions and technical areas and the aspirant's capacity for accomplishing the educational requirements. Again, it is not the intent of this study at this point to evaluate the quality of training or all the characteristics of the learner. Our primary purpose is to examine what may be unreasonable training demands, thereby discouraging many who could qualify for technical and some professional occupations and encouraging many unqualified to fail and accepting jobs for which they are overqualified. Furthermore, the psychological damage to such individuals may be even more serious.

Prediction studies have validated rather well the relationship between learning potential or scholastic aptitude and certain criterion measures of success on the job. Is there a point where educational requirements become too high to satisfy occupational demand with the available learning potential of prospective trainees? Also, are some educational and employment requirements placed too high?

If more education is needed in the future for some occupations, according to the evidence in table 4, job analyses would indicate that it is not due to increasing job requirements. The attainment level increase of 1.5 years (1962 - 1975) for service workers and private household workers has not been substantiated, nor the 1.4 years for operatives. The training requirements for craftsmen are not expected to increase 1.3 years, but the educational attainment requirement is increasing constantly.

The attainment of clerical workers is not expected to increase during the 13 - year period. If it were to increase .4 years, they would qualify as managers. The argument for hiring young entrants who qualify as potential managers, vertically mobile, is reasonable but only for enough who will be able to qualify through additional training and experience. Little attention is now given to identifying this group. A generalization is made that more and better education is needed in this day of technological change and most every child is subjected to the pressure indiscrimately.

If it takes a college degree to qualify for certain occupations, how many high school freshmen at the age of decision have the necessary learning ability to graduate from college, or whose probability of graduating is 2:1? The average college freshman has a scholastic aptitude score of approximately one standard deviation above the mean for the general population. The reliability of a scholastic aptitude test is high and, therefore, a high school freshman should be a standard deviation above the mean, or have an I.Q. of about 115, (on any of several I.Q. tests with a SD of 15). His chances of success are about 2:1. About 17 percent of the population are so favored, or about 15.1 million. The benchmark estimate for the professions in 1975 is 12.4 m.

Other factors are positively related to college graduation, but a counselor must identify as accurately as possible those with the best probabilities for success in various training programs leading to vocational success and satisfaction.

One must conclude that as far as learning aptitude is concerned, to meet established criteria of success in the professions, the relatively fixed element of aptitude limits the number of trainees to no more than the number now in training. Improved teaching methods and motivation techniques could conceivably increase the number of graduates, but, of course, graduation from college serves needs other than vocational and for occupations other than currently high priority occupations.

It can be argued with good reason that probably 25 percent of those in occupations with lower educational requirements than the professions have the scholastic aptitude to succeed in professional and technical training. One would also have to accept the probability that 25 percent of those in the professions were better qualified for something less. Bingham did find that the AGCT scores for World War II personnel showed that 25 percent of the accountants who had the highest average AGCT score had scores lower than the top 25 percent of teamsters that had the lowest mean score.

It may be tentatively concluded from the above evidence that educational requirements should be more closely related to job requirements based on job analysis, and that trainees should be selected on the basis of established criteria for predicting probable training and employment success. Generalizations based on subjective status values of occupations and educational attainment need to be re-examined in the light of criteria of job and personal satisfactions.

The important consideration in the future for relating education and employment will be objective and purposeful planning by both the individual and the institutions serving individual needs. First, long and short term social and economic goals and priorities will be established. Second, estimates of manpower requirements based on those goals will be studied carefully and results disseminated to educational planners for cooperative curriculum development programming. Third, individual planning will include broad exploratory experiences in counseling and instruction early in the secondary school years and becoming more differentiating as aptitudes, interests, and individual needs develop.

There is little time remaining for romantics and unreal goal aspirations and no time remaining for unreasonable and unqualified educational requirements.

CLUSTERING FOR VOCATIONAL PROGRAMMING AND COUNSELING

A recent development in vocational education and counseling that promises to benefit all those working in either area is a re-examination of systems for grouping or clustering in new dimensions. An occupational structure by industry might be helpful for some purposes, but it would be of little help to educational planners, especially in the secondary schools. One can major in transportation at the college level or seek employment in the transportation industry for a variety of reasons, but a transportation curriculum would not provide training in driving a truck, flying an airplane, and piloting a steamship.

Clustering or grouping occupations has a longitudinal dimension ranging from a global egocentric basis among children to a rigid differentiation for those in or ready to enter the labor force. Not all individuals progress through the developmental cycle at the same rate and so in training and projecting manpower needs one must be alert to individual differences.

It has also become generally accepted among educators and personnel workers that formal training institutions should provide a broad range of exploratory and skill learning experiences as well as providing a basic core of academic training. Employers would be expected to provide the specific job skills, at least in vocational and technical occupations. Such an approach has the additional advantage of recognizing the need for a broad range of training to permit job flexibility in a labor force requiring of many workers major employment changes several times during a life career.

A variety of systems have been developed for clustering occupations to permit more meaningful training programs. No one system is superior to others in all respects. Each system, however, is probably superior to others depending upon one's purpose.

1. The second volume of the DOT complements Volume 1, definitions of jobs, by grouping jobs having the same basic occupational, industrial, or worker characteristics. The system is very useful to counselors and placement personnel in dealing with persons planning careers or seeking employment. (Later in this section DOT data will be used to structure vocational educational planning.)

2. Several recent research efforts in the schools have studied a variety of dimensions.

   a. The University of Maryland (14) project illustrated the cluster concept by taking one industrial arts area - electro-mechanical installation and repair - and analyzed necessary job entry tasks and those needed soon after entering the occupation. The task statements were written in behavioral terms for each of four occupations within the cluster; air conditioning and refrigeration servicing, business machine servicing, and radio and television servicing.

   b. The Industrial Education Department of the Los Angeles schools (15) has developed guidelines for each of seven vocational careers, or clusters:

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(14) Donald Maley, An Investigation and Development of the Cluster Concept as a Program in Vocational Education at the Secondary School Level. College Park: University of Maryland, 1966.

(15) Los Angeles City Schools, Evaluation and Research Section, #260, Careers Related to Industrial Education. Los Angeles: Los Angeles City Schools, 1964.

auto mechanics, drafting, electronics, graphic arts, industrial crafts, metalworking and woodworking. Within each cluster a variety of more specific occupations are described. A cabinetmaker outline within the woodworking cluster would include: personal requirements, education in junior high school (crafts and industrial drawing), education in high school (industrial crafts, architectural drawing, industrial math, and industrial science). For planning purposes after high school various opportunities are covered including 2-year colleges, adult, apprenticeship, and the armed services.

c. The "Vocational Job Patterns in Six Sequences" at Thornton Township High School and Junior College, Harvey, Illinois, (16) is a similar system, but suffers like many by mixing occupations with training opportunities.

The six sequences are:

1 - Industrial
2 - Business
3 - College Summary (teaching, social services, medical, science, law, accounting, art, and literary and entertainment).
4 - Services
5 - Homemaking
6 - Agriculture

Each sequence is broken down to show requirements in mental ability, reading, aptitudes, interests and temperments from unskilled level through college graduation.

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(16) Associated Publishers, Los Altos, California, 1962.

d. The Kansas City plan (17) has a longitudinal dimension which implements developmental principles as the student progresses from a series of global exploratory experiences to specialized skill training for employability or as a prerequisite to more advanced training.

Chart A shows the range of clusters available and the progression of differentiation.

e. Some clustering systems are being developed that will equate occupational areas with secondary school educational majors. The Pittsburgh Educational Parks Plan would set up "little school" units within the "great high school" which would define educational majors in occupational terms. Dr. Donald Super has proposed to structure learning experiences around the following interests based on factor analysis of items used in interest inventories: biological science, physical science, technical, social welfare, business detail, business contact, and linguistic occupations.

This researcher experimented with a ninth grade personal inventory instrument for use in an educational and career guidance unit which would help the student identify with one of the following six areas for educational programming that had a built-in occupational component: commercial, fine arts, homemaking, language arts, life-social sciences, and physical sciences.

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(17) Don R. Sheets and Hollis W. Dahlar, "The Cluster Concept, Kansas City Style", American Vocational Journal, 42, October, 1967, pp. 24-26.

CHART A

PROGRAM OPERATIONAL INFORMATION

Occupational-Vocational-Technical

General Courses
Comprehensive High School

Specialized Courses
Vocational-Technical Center

JOB FAMILY (OR OCCUPATIONAL) CLUSTER	OCCUPATIONAL	VOCATIONAL	TECHNICAL	PROFESSIONAL
1) Electrical 2) Transportation 3) Manufacturing and Fabrication 4) Food Service 5) Visual Communications 6) Business & Distributive 7) Service 8) Health 9) Miscellaneous	Grade Level Served 10-11-12 Time 1 hour - 3 hours Objectives 1) Investigation 2) Orientation 3) Identify interest and ability 4) Develop basic skills Opportunities 1) Further training on advanced levels 2) Part-time employment 3) Full-time payroll job employment 4) Explore other areas	Grade Level Served 11-12-13 Time 2 hours - 3 hours Objectives 1) Develop job skills 2) Develop job knowledge 3) Develop desirable work habits and attitude 4) Secure placement Opportunities 1) Payroll Assignment in a skill area 2) Further training 3) Retraining	Grade Level Served 11-12-13-14 Time 3 hours - 6 hours Objectives 1) Develop technical skills 2) Develop technical knowledge 3) Secure placement Opportunities 1) Payroll assignment as a technician 2) Further training 3) Retraining	

CHART A (Continued)

1) Students will not be involved in rigid admission requirements in identifying themselves with one or more of the "job clusters" listed in the first column.

2) Students will be counseled and guided as they progress through the series of "job clusters" learning units to strive for the maximum entry job-level compatible with their ability.

3) Students having achieved occupational maturity may, if they desire, transfer to the central specialized facility.

4) If, for any reason whatever, the student does not advance, he or she can:
   a) Change clusters to explore another family of occupations,
   b) Remain and continue to gain strength in entry-level skills that are commensurate with his or her ability,
   c) Enter a school-job situation,
   d) Enter the labor market with some skills upon school termination.
5) Flexibility is necessary if students are to be served adequately.

Clustering by Job Function

Each of the clustering systems described above has many advantages, depending upon the purpose to be served in the school, primarily secondary schools. They have one thing in common, they are structured by occupation or industry, sometimes both. For educational planning it has been difficult to relate all areas of work to secondary school curricular programs, and more difficult to use groupings by industry.

It was proposed in this elementary study to determine if the data reported in Volume II of the DOT would permit a clustering of worker functions and worker trait characteristics programming. If clusters could be identified, it was further hypothesized that such clusters could be translated into vocational curriculum programs.

All of the advantages of the other systems were included in the proposed model - mobility from a broad exploratory base to increasing differentiation and movement within a broad field. The functional cluster system provided an additional feature basic to the Dictionary of Occupational Titles, in which titles and functions are included in the 6-digit code number. A job applicant moves vertically and horizantally by functions he can perform, not by job title, except that the title assumes competency in certain skills and functions.

The source data, then, for this study was Volume II of the DOT. There one will find 114 Worker Trait Groups classified under 22 areas of work.

The worker trait arrangement of titles and codes in the Dictionary of Occupational Titles provides basic technical information on occupations essential for any study of employment and educational planning. Each of the 114 WTG's includes one or more set of worker functions coded by the 4th, 5th and 6th digits.* In addition the required worker functions by levels of complexity, the educational planner will find profiles of worker trait characteristics or qualifications. The worker functions served as the independent variable and the trait characteristics as dependent variables.

The qualifications or worker trait profiles for each Worker Trait Group provide essential data including training time, aptitudes, interests, temperaments and physical demands. These profiles combined with the function and skill requirements for each Worker Trait Group provides the basic data needed for counseling, selection of students, and for curriculum planning. The data reported are both empirical and experimental as a result of years of job study and analysis.**

Vocational educators have been studying new skill requirements, a changing occupational structure, and new occupations to determine if a new curriculum structure could serve their needs better than the current one stressing seven basic areas: Home Economics, Agriculture, Distributive Education, Health Education, Office Education, Technical, Trade and Industrial Education. Or a study might show that substantive changes within the seven curriculum areas could incorporate changing technology, objectives and job requirements.

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* The 4th, 5th and 6th digit in DOT codes represent the functional level in each of three hierarchies - Data, 4th digit, People, 5th digit, and Things, 6th digit. A Vari-typist, 203.582 requires Data level 5, People level 8 and Things level 2. The hierarchies and functional levels are defined in DOT, Vol. II, pp.649-650 (1965)

** The reader is asked to familiarize himself with the explanation of relationships within Data, People and Things hierarchies, appendix A, Vol. II, DOT, pp.649-650 and independent variables in this study. The explanation of work trait components, appendix B, DOT, pp.651-656 describe the 6 components used as dependent variables.

There appeared to be several possible advantages to a system of functional clustering:

1. Functions necessary to perform a certain occupation could serve as the basis for defining behavioral objectives in curriculum development.
2. An occupational structure built on job titles is more vulnerable to change than job functions.
3. The interest and temperament components have already been related to functions in DOT research.
4. Aptitudes as another qualification component are used to predict potentialities for performing job functions, not job titles, or an occupation. Common usage relates aptitudes to a job title, but technically, aptitude measures are standarized on ability to perform the job, i.e., the functions of the job.

Agriculture, for example, may be a declining occupation, but functions performed in agricultural occupations are not declining. Ability to analyze data, to discover facts and/or develop knowledge, concepts, or interpretations in Botany (worker trait function "0" in Data hierarchy) could be equally applicable to food production and pharmacy depending upon one's interests or manpower demands. Also, an "0" function level in Data could be related to "Persuading" people (level "5" of People hierarchy), or "Serving" people (level "7"), interests and abilities in sales work or being a waitress would make a difference in the training phase of one's career development. Furthermore, skills in persuasion have transfer value when needed to adjust to changing manpower demands.

Two approaches were taken to test the hypothesis that the worker functions and characteristics of the DOT could be used for identifying meaningful vocational clusters.

1. Determine by inspection the relationships between worker functions and qualifications for a selected group of Worker Trait Groups. (Those 30 WTG's that require only one of three functions.)
2. Sort an arbitrary worker function code (.000) by training time, aptitudes, interest and temperament components to determine if a cluster (s) survived a series of sorts using rather rigid criteria.

Worker Function and Qualification Relationships

As previously pointed out, the Dictionary is based on the premise that all jobs require a worker to function in varying degrees in relation to three hierarchial functions - namely, Data, People and Things. It is further assumed that within each of the three hierarchies nine levels of functioning arrange themselves from the most complex, level "0", to the least complex, level "7", with level "8" indicating "not significant" for that occupation. Most occupations require a worker to function in more than one hierarchy. Of the 114 Worker Trait Groups, only 30 require only one function: Data only 16, People only 9, and Things only 5.*

Table 5 shows the distribution of functional levels for each of the three hierarchies. "Data" and "Things" functional hierarchies group themselves at the "complex" end of the scale, 88 of the 96 Worker Trait Groups with a "Data" component (exclusive of the 18 within an "8" level of complexity) are above the average level of complexity. "People" functions distribute themselves bi-modally.

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* Most of the Worker Trait Groups which include many separate job titles would necessarily show different functional and worker trait patterns. In all such cases more than one coded function or trait would be reported with the most frequent one listed first. For purposes of this study, only the first code was used.

Tables 6 and 7 distribute the hierarchies by combinations of functions and levels.

When the three functions - Data, People and Things - were analyzed to determine their relationship to aptitudes on a 5-point scale, some interesting observations were made. Table 11 reports the distribution for 16 of 114 Worker Trait Groups requiring a worker to function in relation to "Data" only, for 9 WTG's requiring a "People" function and 5 WTG's requiring one to function in the area of "Things". (There is no significance in the unequal distribution of groups by function. Of the 114 WTG's 96 require Data, 69 People, and 42 require some degree of functioning in the area of Things.)

There appears to be a linear relationship between level of complexity in Data and those aptitudes identified in most intelligence tests as predictors of scholastic aptitude. Therefore, if a worker wishes to enter an occupation requiring a "0" or "1" level of complexity in information, knowledge and conceptions related to Data, People, or Things, obtained by observation, investigation, interpretation, visualization, mental creation; incapable of being touched; etc. (DOT, Volume II, definition of Data function, p. 649), he will need to possess general learning ability (intelligence) equal to the top third of the population (aptitude levels 1 and 2), that is, according to DOT, Volume II criteria.

TABLE 5

SUMMARY OF WORKER FUNCTIONS BY LEVELS OF COMPLEXITY *

					Level						
Function	0	1	2	3	4	5	6	7	8	T	
Data	18	34	25	11	3	2	0	3	18	114	Data only ----------- 16
People	5	2	13	5	8	5	28	3	45	114	People only --------- 9
Things	3	18	7	5	4	1	1	3	72	114	Things only --------- 5

TABLE 6

DISTRIBUTION BY COMBINATIONS OF FUNCTIONS AND LEVELS

					People				
Data	0	1	2	3	4	5	6	7	T
0		1	2	1	5	0	2	0	11
1	4	5	3	4	1	2	7	0	26
2	0	0	0	0	0	0	3	0	3
3							2		2
4									0
5									0
6									0
7									0
T	4	6	5	5	6	2	14	0	42

					Things				
Data	0	1	2	3	4	5	6	7	T
0		3							3
1		3						2	5
2	2	3	2	1			1		9
3			2	2	1		1		6
4					1				1
5									0
6									0
7	1	1	1						3
T	3	10	5	3	2	0	2	2	27

* Recorded degrees 1 to 7 only. 8 - "Not significant".

TABLE 6 (Continued)

	Things								
People	0	1	2	3	4	5	6	7	T
0		1							1
1									0
2		1							1
3	1	1							2
4									0
5		2							2
6		1	2	2					5
7		1			1				2
									13

TABLE 7 *

Worker Trait Title	Level of each Function		
	Data	People	Things
Decorating & art work	0	3	1
Supervisory work	1	3	0
Costuming, Tailoring	2	6	1
Health, Physics	0	2	1
Surgery	1	0	1
Sales and Service work	2	5	1
Beautician & Barbering work	2	7	1

* Worker Trait Groups with all three function hierarchies.

TABLE 8

WORKER TRAIT GROUPS REQUIRING ONLY DATA FUNCTION *

Function Level	GED	SVP	Worker Trait Group	Area of Work
0	6	8	Musical work, creative	Music
0	6	8	Mathematics, phy. sciences	Math & Science
0	6	7	Creative writing	Writing
0	5	7	Social science, Psych.	Counseling
1	5	7	Technical writing	Engineering
1	5	7	Surveying, prospecting	Engineering
1	5	7	Accounting, auditing	Business
1	5	7	Industrial engineering	Engineering
2	5	7	Translating, editing	Writing
2	5	7	Corresponding and related	Business
2	5	7	Title and Contract search	Business
3	4	3	Classifying, filing	Clerical
3	3	5	Stenographic and related	Clerical
3	3	3	Computing and related	Clerical
5	3	4	Typing and related	Clerical
5	3	3	Routine checking	Clerical

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* As a matter of interest, tables 8-10 report the titles, area of work, level of functioning and training time requirements for each of the WTG's requiring the worker to function in only one hierarchy.

TABLE 9

PEOPLE ONLY

Function Level	GED	SVP	Worker Trait Group	Area of Work
4	2	2	Specialty entertainment	Entertaining
4	3	2	Selling and related	Merchandising
6	3	3	Modeling and related	Entertaining
6	2	2	Ushering, messenger	Personal Service
6	3	2	Accomodating work	Personal Service
6	3	2	Food service, portering valeting	Personal Service
6	3	3	Protecting and related	Law
6	2	2	Signaling and related	Elemental
7	3	2	Child and adult care	Medical

TABLE 10

THINGS ONLY

Function Level	GED	SVP	Worker Trait Group	Area of Work
3	3	4	Driving, operating	Machine Work
4	2	3	Manipulating	Crafts
5	2	2	Tending	Machine Work
6	1	2	Feeding, Offbearing	Elemental
7	1	2	Handling	Elemental

It will also be noted that the Data function relates positively to aptitudes verbal and numerical, and to a small degree, spatial, but not to any of the other five aptitudes.

There is no linear relationship between functions and aptitudes for People and Things, but it is obvious that the Worker Trait Groups that require functioning in only People and Things require a degree of complexity below the average on the DOT scale and a narrow range of aptitude, especially the Things function where a few of the WTG's require the middle third of the population and the bottom third of the aptitude scale on most aptitudes.

This leads to a conclusion that in occupations requiring the worker to function exclusively with either People or Things, a person with below average aptitude scores could function satisfactorily in at least two-thirds of the People or Things occupations. His interest and temperament patterns might then be the determining factors.

It might be more appropriate, however, to generalize that if a worker was in an occupation requiring him to function with Data or People or Things, or both People and Things, the G.V.N. aptitudes would be the best predictors. Lidewise, selection criteria should weight those three aptitudes higher than other aptitudes.

TABLE II

RELATIONSHIPS BETWEEN FUNCTIONS AND CERTAIN WORKER TRAIT CHARACTERISTICS

(For those Worker Trait Groups that require a worker to function in only one of 3 function hierarchies - Data, People or Things)

	APTITUDES *																																			
	G				V				N				S				P				Q				K				F				M			
Data Function	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
0				4			1	3	1	1	1	1	2	1		1	2	1	1			3	1		3	1			3	1			3	1		
1			2	2			3	1		1	1	2		1	3		2		2			3	1		3	1			3	1			3	1		
2			3				2	1		3			3				3					2	1		3				3				3			
3		3				2	1		1	2			3				1	1	1			1	2		1	1	1		1	2			1	2		
4																																				
5		2				2			2				2				1	1					1			2			1	1			1	1		
6																																				
7																																				
People Function	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
0																																				
1																																				
2																																				
3																		1																		
4		1				1			1					1											1				1				1			
5		1				1				1			1					1								1			1					1		
6	2	5			3	4			5				7				7				6				5				7				5	2		
7																									1											
Things Function	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
0																																				
1																																				
2																																				
3		1			1				1					1			1				1					1			1					1		
4		1			1				1				1					1			1					1				1				1		
5	1				1				1				1				1				1				1				1					1		
6	2				1				1				1				1				1				1				1				1			
7					1				1				1				1				1					1			1				1			

* Did not use Eye-Hand-Foot coordination or color perception as infrequently appropriate. Do not show level 5 for same reason.

TABLE 12

RELATIONSHIP BETWEEN GED* AND FUNCTIONS
(114 WORKER TRAIT GROUPS)

GED	Data Level of Function								
	7	6	5	4	3	2	1	0	T
6							3	6	9
5						5	15	7	27
4					5	14	14	5	38
3	3		2	2	6	6	2		21
2				1					1
1									
T	3	0	2	3	11	25	34	18	96

GED Mean - 4.2
Function Mean - 1.7

	People Function								
	7	6	5	4	3	2	1	0	T
6						1		1	2
5		6	1	2	1	4	1	4	19
4	1	7	3	4	4	5	1		25
3	1	12	1	1		3			18
2	1	3		1					5
1									
T	3	28	5	8	5	13	2	5	69

GED Mean - 3.9
Function Mean - 4.2

	Things Function								
	7	6	5	4	3	2	1	0	T
6	1						3		4
5							5		5
4	1			1	1	3	8	2	16
3					3	4	2	1	11
2			1	3	1				5
1	1	1							2
T	3	1	1	4	5	7	18	3	42

GED Mean - 3.8
Function Mean - 2.4

* General Education Level, Definitions, DOT, Volume II, pp. 651-652

TABLE 12 A

RELATIONSHIP BETWEEN SVP AND FUNCTIONS
(114 WORKER TRAIT GROUPS)

SVP *	Data Level of Function								
	7	6	5	4	3	2	1	0	T
8-9	1						7	9	17
7						12	15	7	34
6					1	5	9	1	16
5	1				3	4	1	1	10
3-4	1	0	2	1	6	2	2		14
1-2				2	1	2			5
T	3	0	2	3	11	25	34	18	96

SVP Mean - 6.2
Function Mean - 1.7

	People Function								
	7	6	5	4	3	2	1	0	T
8-9				2	3	1	1	2	9
7		9	1	2	1	4		1	18
6	1	3	1	1	1	7	1	2	17
5		2	1	1		1			5
3-4	1	8		1					10
1-2	1	6	2	1					10
T	3	28	5	8	5	13	2	5	69

SVP Mean - 5.7
Function Mean - 4.2

	Things Function								
	7	6	5	4	3	2	1	0	T
8-9	2						4	1	7
7					1	2	9	1	13
6				1			2		3
5						2	1		3
3-4				2	4	2	2	1	11
1-2	1	1	1	1		1			5
T	3	1	1	4	5	7	18	3	42

SVP Mean - 5.7
Function Mean - 2.4

* Special Vocational Preparation, Definitions, DOT, Volume II, pp. 652-653.

1. The linear relationship between GED and function is clearly established, especially in the Data function, but on People, the relationship is less well established. The more complex the function, the higher the level of general education development.

2. The Data mean on GED is higher, 4.2 than on People, 3.9 and Things, 3.8. Converted into grade levels, the average on Data function would be some college, while both People and Things would be slightly less than high school graduation.

3. The mean level of complexity for Data, 1.2 requires the worker to perform at a high level, coordinating, synthesizing and analyzing. The bimodal distribution for People brings the mean, 4.2, down to persuasion, diversion and low level supervision. The Things level of complexity is above average, 2.3, or operating - controlling and driving - operating.

4. Another way of looking at educational level is in terms of the level of complexity at which a high school graduate, code level 4, can function satisfactorily. In the Data function, 42.7 percent of high school graduates or less ($M = 41$), could perform adequately at the top three levels of complexity, 0 - 2, and 47.6 percent in worker trait groups requiring adequate functioning in Things. However, in the People function, only 13 percent of high school graduates or less could function satisfactorily in the top three levels of complexity. But 50 percent of the worker trait groups require less than a high school level GED (Mean 3.9).

It would appear that the WTG's selected to examine the first aspect of this study do not demonstrate the same pattern of complexity for each function, or that the bimodal nature of People functioning would destroy some of the linearity with the GED component.

The relationship between Special Vocational Preparation and the level of complexity (table 12A) of the function is very similar to the GED function relationship. Data shows the highest relationship followed by Things and People, the latter again approaching no relationship.

The degree of complexity by function remains the same, of course, as in GED. The training requirement mean scores are relatively the same as for GED People and Things require a little less than one year of SVP, and Data requires a little over one year of special training.

TABLE 13

RELATIONSHIP BETWEEN FUNCTIONS AND INTERESTS

Function Level	Interests									
	1	2	3	4	5	6	7	8	9	0
0						1	2	2		
1	1						3			
2		1				2				
3	1	1	2							
4					1				1	
5		1	3							
6	1	4	2			1				
7				1						

It would not be expected that there would be a linear relationship between these two dimensions. A scatterplot is used to examine what kinds of interests are characteristic of certain degree levels of functioning when all three functions of Data, People and Things are combined.

Those worker trait groups requiring the worker to function at a complex level, 0 to 2, are characterized by people over things, scientific activities rather than those dealing with business people, and creative over organized activities. A certain compulsiveness and rigidity appears to characterize WTG at less complex end of function dimension. Groups requiring complex functioning tend to be those favoring abstract, people and scientific patterns of interest. Service and esteem interests are characteristic of only 3 of the 31 WTG's.

TABLE 14

RELATIONSHIP BETWEEN FUNCTIONS AND TEMPERAMENTS

				Temperaments								
Function Level	1	2	3	4	5	6	7	8	9	0	X	Y
0				2					1		1	
1				2						2		
2									3			
3		2	2									
4		1										
5		2	1		1							
6	1	1	2		3							
7		1			1							

The different types of occupational situations to which workers must adjust do not distribute themselves over the total range. Neither do the temperament traits pattern themselves by function level. The group of seven, 9 to X, require temperament patterns for evaluation and interpretation situations. Situations 2 to 5 include all other WTG's except 1. It is difficult to generalize about a group of situations, but the uneven distribution suggests some factors operating other than chance. Numbers 2 and 3 suggest a certain rigidity of fixed procedures, and 4 and 5 relate to management and control.

Component Patterns

A second sampling of Worker Trait Groups was used to experiment with the possibility of identifying clusters of worker functions in combination with worker characteristics. It was arbitrarily decided to use all Worker Trait Groups with a "0" level of functional complexity. The criterion isolated 25 Worker Trait Groups, 17 in Data, 6 in People, and 3 in Things (one group had a "0" level of complexity in both Data and People). There was no more reason for using the "0" level on each of three functions than for any other combination. Actually, there is no WTG coded .000, although 'Surgeon' has a .101 code. By using the "0" level of complexity for functions, three relatively different functions, each with different definitions of complexity, 25 WTG's were selected. They had in common only the coded level of complexity. However, it was felt that such a rigid criterion would be best to test the assumption that clusters of function and level of complexity might be identified which could be related to the 6 DOT worker trait components, a most improbable combination of functions was used.

If the hypothesis was confirmed that such clusters could be isolated, then it would follow that:

1. Learning experiences could be patterned in secondary schools permitting grouping of students by skills, aptitudes, interests and

temperaments, those components accepted by most authorities as relevant to vocational planning.

2. Changes in interest patterns would permit the individual to change career goals without sacrificing skills in training already acquired.

Table 15 demonstrates the distribution of the 25 experimental groups by areas of work.

TABLE 15

DISTRIBUTION OF 25 EXPERIMENTAL WORKER TRAIT GROUPS BY AREAS OF WORK

Areas Containing Experimental WTG's		Areas Containing no Experimental WTG's
Art	4	Business Relations
Counseling and social work	2	Clerical Work
Crafts	1	Education and Training
Engineering	1	Elemental Work
Entertainment	5	Farming, Fishing and Forestry
Law & Law Enforcement	1	Investigating, Testing
Machine Work	2	Managerial & Supervisory
Medicine & Health	2	Photography & Communications
Merchandising	1	Transportation
Music	1	
Writing	2	
Math & Science	3	

TABLE 16

DISTRIBUTION OF QUALIFICATIONS BY WORKER TRAIT GROUPS

Worker Trait Groups	Training		Aptitudes		Interests	Temperaments
	GED	SVP	Gen.	Verbal		
Journalism & Editorial	5	8	1	1	5	4
Decorating & Art Work	5	8	1	1	8	X
Rhythmics	5	8	2	3	5	X
Health Physics	6	8	1	1	1	4
Engineering Research	6	8	1	1	7	4
Musical work, creative	6	8	1	2	6	9
Creative Writing	6	8	1	1	7	9
Math, Physical Science	6	8	1	1	7	4
Surgery	6	8	1	1	7	9
Art instruction	5	7	1	2	5	1
Promotion & Publicity	5	7	2	2	2	4
Art work	5	7	2	2	8	X
Scientific research	5	7	1	1	1	1
Counseling & Guidance	5	7	1	1	4	5
Musical work, vocal	4	7	2	2	5	5
Dramatics	4	7	1	1	4	5
Photography	4	7	2		9	X
Set-up, Machine operating	4	7	3		9	Y

When the 25 "0" WTG's were grouped by GED and SVP training requirement, table 16 , 18 of the 25 groups arranged themselves in four classes: 6 -8 (6), 5 - 8 (3), 5 - 7 (5) and 4 - 7 (4). All 18 require from 2 to 4 years of special training or more, and all but 4 require the top 2 levels of GED (equivalent to 14th grade or more).

All 18 have a high G and V aptitude component with all but one in the top third of the population. It would be expected that training time and learning aptitudes would show a high correlation because each component is related to functional level.

The interests tended to cluster around two types of activities. One group of 7 had a "5" interest level with preferences for activities resulting in prestige, or the esteem of others, including entertainment, art and writing. Another group of five, engineering, math, medicine and counseling-social work, clustered in scientific and technical activities.

Of the 18 WTG's with the highest level of complexity for three functions and similar training and aptitude patterns, 11 of them grouped themselves around 3 interest activities - namely, prestige (5), scientific and technical (3), and creative (3). With eleven of the original 25 WTG's with an "0" function level of complexity on a sixth dimension, temperament, 7 fall under two of the 12 temperaments, or adjustment situations. One consisted of situations involving the control, direction, and planning activities of others. The other related to situations involving interpretations of feeling, ideas or facts in terms of personal viewpoint. Thus, 7 of the original sample of 25 survived 6 sorts with rigid tolerances. One would not expect such consistency on four components with six dimensions for the independent variable - level of complexity for three worker functions.

Conclusions

1. The implications of this limited experimental study show promise for curriculum programming and student counseling students for educational and career planning. All of the function and qualification data used in the DOT, Volume II, to code occupations could be arranged in combinations approaching infinity. An empirical study utilizing computers could probably identify clusters of functions permitting vertical and horizontal mobility consistent with manpower demand and curriculum capability. At least behavioral objectives could be defined more meaningfully for both the employer and the educator (curriculum planner and counselor).

2. The data from DOT, Volume II needs to be evaluated carefully depending upon the way it is to be used. For example, some areas appear to be out of balance with others. The Worker Trait Groups have a disproportionate number of groups requiring skill in the Data function. The levels of Data functioning seem concentrated at the complex end of the scale. The conventional aptitudes, G, V and N, used in general intelligence tests may have been given too much weight

in WTG's requiring several of the eleven aptitudes.

3. If it is found on further examination that job functions do not provide a useful model for vocational preparation, counseling and placement, guidelines for vocational education courses could develop behavioral objectives from the eight levels of complexity for three functions - Data, People and Things.

4. The model developed in this study can be useful to persons involved in the preparation of occupational information for career and educational planning, i.e., monographs and programmed counseling systems.

VOCATIONAL COUNSELING SERVICES IN THE EDUCATIONAL PROCESS

An analysis of current and projected economic and social forces of American culture have demonstrated in NPA's study a close relationship with education. It is apparent that the roles of formal institutions and other societal forces are interacting and interrelated in a dynamic relationship. Achieving the goals and objectives of optimum manpower development in the rural and inner city populations of the country will require maximum output of curricular and non-instructional experiences in all sections of the educational system. This and other papers building bridges between manpower demand and the response of the educational system have ---

1. Recognized the significant relationships between manpower development

and education, planned and purposeful education.

2. Emphasized that education serves a variety of societal and individual goals, one of which is to help youth attain and maintain vocational maturity throughout a life of work and leisure.

3. Challenged educators to utilize innovations in educational technology.

4. Experimented with new organizational patterns and systems of relating educational and career planning.

For our purposes, "vocational counseling" will be used instead of "vocational guidance". A further limitation will be made by concentrating on choice-making and exploratory vocational experiences for youth although some references will be made to adult counseling and placement services.

Counseling has become a point on a dimension somewhere between the concepts of guidance as decision making and psychotherapy as a process of personality reorganization. The counselor and his work differs from the other two in many conflicting ways. He sees his "subject" as a counselee and not a client. He may perceive the process as a combination of information specialist and therapist dealing with emotional content, attitudes and feelings.

Recognizing the complexity of the decision making process and the interrelated social, economic, and psychological elements in adjusting oneself to the world of work, "counseling", its content and process, expresses the relationship between counselor and counselee better than guidance worker or therapist. Likewise, "career" as a sequence of choices, as a developmental growth process best describes the functions to be performed in an educational setting rather than "guidance" or "therapy".

This elaboration on the nature of counseling is provided to establish a frame of reference for the process of making career decisions. The current lack of agreement, or at least consensus among practitioners and users seems to make such a distinction necessary. Counseling, like education, is a growth experience, a learning process. How economic balance is maintained in the labor force while simultaneously maintaining respect for the integrity and ability of the individual to make his own decisions is the difficult domain of the vocational or career counselor.

Even a generation in the future despite efforts of counselors there will not be enough personnel trained to fill the top level vacancies and there will not be enough willing to perform the millions of available jobs at the bottom rung of the ladder. The status values of jobs will not be altered in the forseeable future. Discrimination by sex and race will still operate. Some jobs, some people, some training programs, some national goals will take priority over others. These issues are products of our social and economic systems. And counselors are products of the system the same as other workers. One of the best predictors of constructive change in vocational counseling for the future is the intensive activity currently evident within the profession. For example, the guidance section of the American Vocational Association is preparing a policy paper with a rationale and a framework for guidance in American education. Another current project is sponsored by the National Vocational Guidance Association to examine the basic concepts of vocational counseling and those pertaining to work in the life of man. With the completion of these projects, criteria for evaluating counseling and guidance services will be more articulate. Standards should emerge from these two efforts against which program planners can measure their effectiveness and identify directions for future growth. As a result, the roles and functions of educators, employment service personnel, employers, private vocational and technical schools can be reformulated to facilitate better coordination of effort. Programs can then be developed that will reflect new purpose and new enthusiasm.

When educational policies are formulated to provide administrative support, counselors can then share the responsibility for functioning adequately in the areas that follow.

1. The primary responsibility of the counselor is to counselees and not to institutions or agencies. He facilitates the efforts of other agencies more directly concerned with employment by facilitating the total growth of the counselee toward self-fulfillment and self-responsibility. He is not a recruiter, but he does help counselees make choices.
2. The counselor is responsible for helping youth learn how to make decisions appropriate to their development stages. Direct counseling and consultation services to teachers and parents can facilitate youth's growth toward maturity and independence. Learning how to make educational plans and career decisions is facilitated by opportunities to make decisions in the home, to be involved in classroom planning, and even the opportunity to make wrong decisions. It has been well established in clinical practice and by students of human behavior that a

sense of identity, of feeling that one's own behavior makes a difference, is directly related to personal and social maturity, including vocational maturity. Children and adults demand when a basic need to participate, to assume self responsibility, is denied. The counselor, not as the expert, not as the only one who knows the secrets of wholesome growth, but as one committed by attitude, training and assignment is the best member of the staff, best able to organize and coordinate a program of personal and social adjustment. Career, or occupational decisions are difficult and traumatic for the insecure youth or adult, for the one who has not had the opportunity to experience other decision making situations. Making a career choice is stimulating for the secure, the experienced decision maker, for one who has dealt with change and discontinuities before.

3. The counselor has a major responsibility for providing information for decisions makers - students, administrators, parents, employers, all those involved in the vocational adjustment process. If the student needs help in understanding himself, others, the labor market or sources of education, the counselor, as part of his contribution to the student's total adjustment process, is the responsible person for organizing and coordinating programs to provide necessary information services.

4. Primarily because of their training, but also because of the current organization structure found in most schools, counselors have responsibilities for related services. Among these are placement, both employment and educational scheduling and programming; research evaluation and informational systems, including follow-up and testing, both group and individual assessment.

Most criticism of vocational counseling today is directed toward (1) inadequate information, both quality and quantity, about the world of work as a concept and its structure, and (2) the heavy emphasis in counselor training on the social and psychological information components of career choice. Others would contend the criticism is unjustified. Counselors are caught in the cross fire of charges and counter charges. Proponents of each position would not deny that the content of vocational counseling involves both kinds of information - occupational personal. Some evaluators of policies and programs in the schools report that occupational information programs do not provide information on labor force needs and trends and therefore conclude that the programs are inadequate. Other investigators find that decision making is a most complex phenomenon, affected by social and psychological factors operating from childhood and therefore that career choice is continuous, developmental and multifaceted. Both positions are well established and documented, but serious differences of degree threaten to deny youth and adults and therefore, the social and economic system, the necessary resources needed to attain vocational maturity.

Occupational Information Systems

Historically, occupational information systems have consisted of printed monographs and guides. A study in New York State schools by DuBato (18) asked counselors to rank use and usefullness of media to disseminate occupational information with the following results:

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(18) George DuBato, "Structure and Operation of a Model Occupational Information Unit", New York: The University of the State of New York, 1967.

Media	Use	Usefullness
Private and commercial briefs	1	1
Posters	2	14
"Occupational Outlook" briefs	3	3
Motion pictures	11	11
Plant tours	15	2
Semester or year courses	21	15

It can be seen from this sampling of his categories that printed materials rank highest in use and they were judged as most useful.

Some workers in the counseling field predict the disappearance of occupational literature by 1980, due primarily to the rapid changes in occupations. The 1965 revision of the Dictionary of Occupational Titles contains 21, 741 job titles of which 6,432 are new since the last edition in 1949. Hopke (19) is not ready to write off printed materials. He predicts that the amount of literature will increase, but that it will change, as follows:

1. There will be more demand for material geared to the occupational needs of the culturally disadvantaged and minority groups, including women.
2. It will be used more in all levels of the curricular program as well as in individual counseling.
3. Data processing and audio-visual equipment will make possible storage and retrieval of information for individual or group use in one system, or on a nation-wide hookup. (See Ofiesh paper.)

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(19) William E. Hopke, "A New Look at Occupational Literature", Vocational Guidance Quarterly, 15, September, 1966, pp. 18-25.

4. There will be a better balance of psychosocial and economic information.
5. There will be more information on the world of non-work.
6. More local and state reports will be made and disseminated.
7. Families of occupations rather than individual occupations will be stressed.
8. There will be more information on training opportunities.

Occupational literature will most certainly be supplemented by new technologies and methods such as computer - assisted counseling systems, gaming techniques and more sophisticated use of communication media. (20)

Experimental systems include those for:

1. Assisting the individual in self evaluation and educational - vocational exploration.
2. Assisting with counselor activities, especially routine tasks and data storage.
3. Assisting in describing the world of work in its many facets and complexities.

The programs are designed to help the user learn how he has decided, as well as how to decide. They are of assistance to the counselee and counselor. They are supplements and not substitutes. They relieve the counselor of much of the clerical activity necessary to occupational information services, but they do much more by giving the counselee the responsibility for active participation in the decision making process. They are available at the time the individual is ready. The flexibility of systems now being developed will strengthen the role of the counselor. It will stimulate differential programming, thus providing multiple options within a flexible schedule better adapted to all students.

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(20) Center for Vocational and Technical Education, Systems Under Development for Vocational Guidance, Ohio State University.

The options would need to provide other kinds of occupational information and exploratory experiences for some, case conferences with parents on many occasions, expand the vocational education course offerings, refer to other counseling services, establish a placement service or a close liaison with community placement services.

If a policy is currently in effect or to be implemented, providing out-of-school services, the systems now being developed for school use will need to be developed for other counseling and educational agencies. Choice points in post high school situations would need to be researched using similar or different designs to those used for secondary school age youth. In terms of overcoming time constraints on the professional counselor's time, a system appropriate for those in the labor force or in process of entering full time may be more important than one for youth.

Psycho-Social Information Systems

Unfortunately, vocational counseling and occupational information are equated in many policy decisions, thus affecting the channels open to individuals in their search to attain vocational maturity. For example, the Vocational Education Act of 1963 defined vocational education as including vocational guidance, and later the Act provided for cooperation between the Office of Education and the Employment Service to provide information on employment trends, thus implying by omission of other elements that occupational adjustment is limited to labor force trends.

The position is taken in this paper that vocational counseling, to be effective, needs to balance occupational information with personal, or psycho-social information. If the individual is to develop as an integrated person in terms of vocational maturity, he needs help in both areas. Because this paper cannot discuss all of the issues relevant to both areas, however, self concept development as a function of one's culture, past experiences, aspirations and current capability for balancing all of life's experiences cannot be overlooked as a major factor in career choice.

Employers have emphasized the need for not only trained entry workers, but workers with good attitudes which is an essential attribute of a mature person. Research has established a significant relationship between emotional maturity and job effectiveness as evidenced by the finding that most discharges are due to lack of skills in relating to others and not lack of job skills. It would follow then that policy-makers would concern themselves with factors contributing to emotional maturity, a major responsibility of counselors in school settings.

The total environment does not function in an integrated and balanced fashion without planning and programming by a responsible agency of society. The school is performing that function for children and youth, and as Harold Taylor (21) has pointed out, "the school must serve an integrating role and not an isolated one. The educator must go to the root of the matter, and he must deal with the whole child. The root is in the social and economic conditions in which the child exists...He must think of education as a total process in which the conditions of society deeply affect the child's mind, the level of his achievement, and the range of his possibilities. The curriculum, the classroom, and the guidance office are instruments for dealing with one part of the child's life. But they do not and cannot function in a social vacuum."

The 1967 ASCD Convention theme in Dallas was 'Humanizing Education'. All speakers observed that the personalized approach would replace the heavy emphasis of today's information approach. Dr. Arthur Combs (22) in his study of teachers has found that there is no difference between good and poor teachers on the amount of knowledge each possessed. Personal meanings are found to be more important than facts which is why computers can be dangerous if one limits teaching to storage and retrieval of facts in the child or the computer.

The role of counseling services in the total development of the individual can be illustrated no better than in the conflicting role models for girls. Girls are more likely than boys to choose courses to prepare for a job. The girls perceive work as an interlude before assuming roles as wives and mothers. To complicate the matter further, schools reinforce the pattern by providing training in the secondary schools for employability. Boys, in our culture, should be more vocationally oriented than girls, but they are not. The schools should provide vocational training for terminal high school boys, but they do not, nor is there any evidence that they intend to unless the current policy to delay vocational training until after graduation is modified.

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(21) Harold Taylor, Saturday Review, December 16, 1961.

(22) From speech delivered at ASCD Convention, Dallas, Texas, March, 1966.

The consequences of increasing community involvement in the educational process, if adopted as a policy, can eliminate some of the current discrepancies in youth employment. The counselor would be expected to identify student needs and characteristics and to operate as change agents in the community and thus he could also be expected to provide needed input to assist in policy formulation.

Some Policy Aspects of Programming Vocational Counseling Services

In addition to keeping students informed on labor force trends and employment opportunities, counseling services have an equal responsibility for keeping administrators and vocational educators aware of local, state and national trends. Counselors will need to attend meetings of employers and labor economists, subscribe to labor force information services, to maintain constant contact with public and private employment services, and to acquaint appropriate agencies with educational needs for information services.

The educational program can reflect needs and trends only if information systems are functioning. The Kaufman (23) study found that the relationship between training and employment was much lower according to follow-up interviews than that reported by the schools. The situation was felt to be due to limited program offerings, inadequate use of advisory committees, poor guidance, placement, and follow-up, all information services.

The vocational education process does not end until the student is established in a job for which he is qualified. Policy to date has not included adequate placement services for at least 80 percent of the secondary schools. Schools have a policy of helping youth take the next step, hopefully to another educational institution, but for those entering the labor force, little is done; even for those who have acquired an employable skill. One of the pertinent issues is the responsibility of the school for job development. Whether the school does it exclusively or in cooperation with other agencies, a policy of total commitment to the vocational development of the student must include active participation in the placement process.

The evidence is quite adequate to demonstrate the inadequacy of all placement services. The labor market operates in an inefficient manner . Informal sources are used far more than institutions organized to help with that next step, a most important one. The community concept can be demonstrated most effectively in this function. Whether one accepts Conant's contention that the school is responsible until the young person is 21 years of age, or whether separation from formal education ends the school's direct responsibility, the school must identify and prepare those who expect to terminate their formal education with the secondary school -- at least a third of the nation's high school graduates.

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(23) Jacob J. Kaufman and others. The Role of the Secondary Schools in the Preparation of Youth for Employment, Pittsburgh: The Pennsylvania State University, Institute for Research on Human Resources, 1967.

Failure to provide adequately for individual differences is an educational sin of omission. Failure to provide inexpensive, short duration skill training to qualify workers for at least half of the nation's jobs must remain in social and psychological costs, the most expensive educational program today. The proportion of students enrolled in the vocational curriculum compared to the proportion of those who obtained jobs after leaving school must be equalled by those who could have gotten jobs for which no training was provided in school or they were not made aware of the opportunities that were available.

Dissemination of information and involvement are complementary processes. The writer found in one survey, of over 40 districts, that less than 10 percent of the secondary school guidance programs utilized community advisory committees. A significant relationship has been found to exist between effective educational programs and community involvement. It is going to be sometime before community participation in the educational program becomes effective. Society must continue to pursue its current either-or course by using non-educational agencies to educate our youth. During the current rash of teacher "holidays" and "professional meeting days" most of those schools have practiced a policy of keeping the schools open by using non-teachers as if anyone can teach, or on the assumption that if a child is sitting at his desk, he is being educated. But worse is the fact that few have questioned such a policy.

Equally convincing are those who contend that only the schools can educate. It would seem inevitable that the increasing complexity of the educational process and the increasing availability of rich resources in the community would encourage a coordinated effort. The role of the counselor in locating job stations, soliciting exploratory work experiences for students, and follow-up research would be best qualified of all professional educators to involve both the school and the community in the educational process.

Exploratory work experiences in the community for occupational familiarization rather than skill attainment would encourage more objective goal aspirations and more purposeful educational and career planning. An elaborate concentration of group and individual counseling at the 9th grade level (in a non-flexible program) during which information on educational and occupational alternatives is systematically provided and supplemented by group and individual counseling with students and parents to better understand past conditioning, future aspirations, and present attitudes and feelings would culminate in tentative choices and plans for the next two or three years. The 10th and 11th years will need to provide opportunities to explore occupations on the job and to observe workers at work - for the future routeman and surgeon. Vocational training would be exploratory during the tenth grade, becoming more differentiated later.

In schools where flexible scheduling is practiced, the above exploratory and counseling experiences would be individualized.

Ninth grade information programs are provided in most schools, adequately in perhaps a third of the schools. Information services are combined with counseling in no more than 20 percent of secondary schools and appropriate programs in less than 10 percent of elementary schools. Furthermore, it has been found from State projected activities reports that only 20-25 percent of the secondary schools provide at least four of the seven Federally assisted vocational education programs.

The sad fact today and for the near future is that almost no Boards of Education have an approved counseling program, nor is there an adequate model for such a program if an administrative policy were adopted to provide maximum vocational education and counseling services.

If occupational adjustment is a life-long process and the responsibility not only of counselors in a school setting but of counselors in all settings related to the individual's work life - the Employment Service, private and other public agencies, and by employers. The consequences of a policy of total community involvement in vocational education as proposed in the preceding section of this paper pertains also to vocational counseling. Education and counseling responsibilities have a sufficient number of common elements to include them together in any program of total community involvement. Both processes are life-long. No one agency is now or probably qualified to provide both services over a lifetime of employment and training.

Much needs to be done regarding the jurisdiction and functional issues involved in any attempt to coordinate counseling services for occupational adjustment. A policy entered into by educational and non-educational facilities recognizing functional capabilities of each will need to recognize the needs of the individual. If the primary activity of the individual is education, counselors in school settings would provide counseling and involve placement and information services when appropriate on a coordinated basis. If the individual is an employee, or seeking employment, industry and the Employment Service would have primary jurisdiction using school counselors on an assist basis. Guidelines for functioning at such a level would need to be prepared and administered at the local level.

The integrating agency for community coordination could be either the government through a regulatory agency, or the local professional organizations representing counselors. The community-wide involvement of counseling resources is currently limited by the absence of an effective framework for either approach. A resolution of this deficiency is imperative. Continued study and communication among all agencies will influence future decision makers to consider at least the possibility of counseling being assigned to the community agency rather than to counselors in specific job settings.

New and innovative systems and methods will be necessary to accomplish the objectives of a balanced supply and demand labor force. New programs, more teachers, improved facilities and equipment are crying needs and the price is high, probably a 100 percent increase in the expenditure per student during the next 20 years. Greater gains, however, can be made and at no cost. It does not cost anything to believe that every child is educable; it takes no more teachers to instill hope in every child that what he does and thinks is very important; new data systems are not necessary to equalize training and employment opportunities for non-whites and women; new buildings are not necessary to train service personnel, hospital attendants, routemen, parking lot attendants. It takes no money to change attitudes, values and behaviors: they require only courage, commitment and respect. It takes no subsidized graduate degree to refrain from excusing our deficiencies of the latter by withholding the temptation to ask: Will schools and teachers become impoverished?

MOBILIZING THE COMMUNITY'S EDUCATIONAL RESOURCES

This paper has examined alternative decisions for satisfying the need for appropriate education to insure vocational maturity for individual fulfillment and to provide a workforce capable of achieving national goals. Mandates for curriculum change, anti-discrimination efforts, and active counseling programs are clear if American education is to keep pace with the changing times. What has not been made obvious so far is the need for an evaluation of the structure of the educational system. Current organizational and administrative patterns may be one of the significant handicaps to change.

Although this paper has challenged an indiscriminate claim for more education, it has defended the claim for more purposeful education. What kinds of education, for whom, and when, and under what administrative systems are questions needing planned, community-wide action; especially the structuring of society's total educational capability.

A summary of some current activities and suggestions will, at least, establish the need for a study of how well the country is organizing its educational capability to accomplish its goal of providing vocational education for everyone who needs and wants it.

1. The public school system and the colleges are by general agreement

meeting most of the needs of the middle two-thirds of the population. The population at the two extremes of ability and cultural dimensions are not faring so well. Dr. Kenneth Clark sees public education as a captive of a white middle class. He proposes a separate system to compete with the urban system. James Coleman and McGeorge Bundy are skeptical about the ability of public education to change.

2. More than 7.5 million Americans of all ages are being trained for skilled jobs through Federally supported vocational and technical education programs, one-half of whom are in post secondary and adult schools, according to Secretary Gardner's report to the President, January 5, 1968. In addition, more than a million students are paying their own tuition at private occupational training schools.

3. It has been noted by the writer (24) that education and training are conducted on a massive scale, and for every one student in college there are two in other post-secondary training institutions. Table 17 also shows the extent of student participation in institutions other than the public and private schools and colleges. (25)

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(24) Harold J. Reed, "Training Opportunities Other Than Four-Year Colleges", Vocational Guidance Quarterly, 14, Autumn, 1965, pp. 16-20

(25) Wilbur Cohen, "Social Goals and Indicators for American Society", Volume II, The Annals, September, 1967, p. 84.

TABLE 17

Vocational, Technical, and Professional Training Outside the Formal Educational Structure, United States, 1940-74

(millions of students)

	1940	1950	1960	1965	1970[a]	1974[a]
Training Institution	11.8	15.3	18.9	25.0	34.0	48.7
Professional and Technical Training	2.5	3.5	4.0	7.8	9.6	18.1
Company Schools	4.7	6.0	6.7	7.2	12.0	17.5
On-the-job Training	2.4	2.0	3.4	4.5	6.0	6.0
Correspondence Schools	1.0	1.5	2.0	2.4	2.8	3.2
Armed Forces	1.0	2.0	2.4	2.6	3.0	3.0
All Other	.2	.3	.4	.5	.6	.9

a: Projected

4. The need for training has caused some to panic and suggest rather immature proposals such as one reported in The Washington Post, February 11, 1968, to transfer ghetto children to suburban homes for vocational training.

5. The Department of Labor in 1964 surveyed the vocational training background of workers between 22 and 64 who had completed less than 3 years of college. It was found that 39 percent had taken some form of occupational training in high school, junior colleges, technical institutes, business schools, correspondence schools, company training, apprenticeships, or the Armed Services. Significantly, those who had obtained the most education before leaving school received the greater part of this training.

6. In order to develop more effective secondary education for the 1970's, the schools will use and evaluate such new techniques and approaches to learning as individualized instruction, comprehensive curricula, and educational technology. The schools plan to accelerate a program to combine vocational and academic offerings into a single, comprehensive curriculum, thereby reducing the traditional separation between college-bound students and those headed directly for jobs after graduation.

7. Vocational education in the secondary school will show only a modest increase and private schools, area vocational schools, and in-service training will assume the major/training function. Industrial arts programs as exploratory vocational training will be greatly increased in the next two decades for two reasons: (1) community-education plazas, or large secondary comprehensive schools will emerge for urban areas where 75 percent of the population will live, and (2) a broad range of pre-vocational experiences will be made available to all students. Non-public training institutions will assume much more of the vocational training load because of two factors: (1) Federal aid will be more available to non-educational agencies (publically supported) as the policy of serving students rather than institutions is applied more widely following a precedence established under the Elementary and Secondary Education Act, and (2) the secondary school will need to develop the flexible scheduling needed to provide short-term skill training courses evenings and Saturdays.

8. The Washington Monitor, January 8, 1968, reported renewed support for an education post in the cabinet, "It would consolidate all Federal education,

work training, and vocational education programs now in the Office of Education, Office of Economic Opportunity, National Science Foundation, and the Department of Labor".

9. A prediction has been made (26) that by 1977 there will be created a National Institute of Learning similar in its independence and functioning to the National Institute of Health. It would carry an R & D in learning, genetic psychology, anthropology, and other social and behavioral sciences.

10. The Iowa State Legislature has passed an amendment to their Area Vocational School Law permitting contract use of private occupational schools to avoid duplication of programs in the public institutions.

11. Three significant developments in the past ten years presage the establishment of a secondary training interval between college and no-college.

   a. If the trends in all of the states are comparable to those in California and Florida, there will be in 1970, 850 public community colleges. There will be a general rapid acceptance of the concept that the community college is an educational resources center for the adult citizen just as it is now enrolling 1 of 3 college entrants. Less than 10 years from now, most citizens of most of the cities will have some contact with their local community college.

   b. The enactment of the Manpower Development and Training Act (MDTA) in 1962 marked a commitment by Congress to bring the Nation's manpower resources and requirements into better balance. Starting at a time of economic recession, the early programs were designed primarily to place recently unemployed workers in new jobs as quickly as possible. In recognition of the increasingly serious problem of youth who are out of school and out of work, the 1963 ammendments provided for expanded youth programs, with particular attention to disadvantaged out-of-school youth, 16 to 21 years of age.

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(26) Ed. E. Booker, Science, 158, November 17, 1967, p. 883.

c. The residential Job Corps program has been an experiment in innovation. According to the 1967 Report, programs that have been prepared include language and study skills, a "why work" series, and a Job Corps reading manual, and six vocational education training programs completed with four in progress. Materials are in use in Canada, Air Training Command and 25 school systems selected by NEA and SASSP. Eight demonstration centers have been established. According to a Louis Harris Survey, of the 75, 410 Job Corps output it was found that six months after leaving, 70 percent had either entered the labor force (76%), the military (10%), or school (14%). Most of the balance of 30% were not completers, of whom:

1-7percent wanted to re-enter Job Corps.
24 percent were under 18.
19 percent faced employment resistance for police records.
53 percent faced low employment opportunities at home location.
91 percent lacked high school diploma or equivalent.

The cost - benefit ratio for translating educational gains into expected lifetime earnings is expected to be between 1.05 and 1.69; an acceptable ratio according to a study is 1.0.

An evaluation of MDTA and Job Corps may suggest to community decision makers that these and other training capabilities may have something to offer the public school system, or they may demonstrate that to meet all of the training needs, the total training capability must be mobilized. The next 10 years will be a period of study with the following 10 years revealing an inevitable involvement of educational resources other than the schools.

The foregoing items suggest a possible answer to the need for manpower development - namely, an organizational structure for mobilizing the immense training resources of this country. Just as existing manpower shortages could be solved now by moving workers from surplus regions to shortage regions, so the shortage of educational facilities could be resolved by a full utilization policy. It has become clear that the range of student characteristics, the social and economic variations within the population, the great variety of educational and training needs of citizens and employers is of such magnitude that no one educational system can cope with the demand.

A national policy for the management of educational affairs common to all training institutions, public and private, would have far-reaching implications for training and retraining. Some of the functions to be performed by such a body would be:

1. To identify any current ommissions and overlapping educational programs. In one city it was observed that the local junior college technical facility was struggling to maintain a program for a few students with obsolete equipment while across the street an MDTA project was flourishing with modern equipment in a rented facility with the junior college teachers teaching the MDTA course to students receiving allowances.
2. To establish a uniform accreditation system for all institutions, public and private, academic and vocational. Accreditation to insure quality education and training is now dispersed among a variety of agencies. The National Commission on Accrediting represents 1,200 colleges and universities and seven national associations of colleges and universities. There is also the Federation of Regional Accrediting Commissions of Higher Education which speaks for the six geographical institutional accrediting agencies.

The complex structure set up for managing the college system is contrasted by an absence of supervision of vocational and technical schools. Fewer than half of the states have any state regulations governing proprietary schools. Except for approving institutions qualified to train veterans of World War II probably no action would have been taken. Federal action was taken under the provisions of Chapter 33, Title 38, U.S. Code and subsequent legislation to recognize accrediting agencies which in turn have made excellent progress in establishing criteria for evaluating correspondence, business school training and, two years ago, accreditation authority for trade and technical schools was granted to the National Association of Trade and Technical Schools.

If uniform certification standards existed, quality education at all levels of training and for all institutions would be more nearly assured because salaries, for one thing, would be competitive.

Accreditation of schools by associations of correspondence, business and vocational schools has demonstrated the value of the process. A study of proprietary business schools in Santa Clara County, California by the Stanford Research Institute concluded that:

> "On the basis of enrollment data, it appears that the proprietary schools might be making a more substantial contribution in instructional areas that are also in the public school domain than had been suspected... fragmentary data indicated that the majority of students from certain schools had little difficulty in finding employment related to their training."

3. A consortium such as a promising practice in college coordination could well be extended to secondary schools and private training facilities in poverty areas now denied because of lack of funds.
4. The problem of recruiting, training and utilization of qualified teachers on an equitable basis for all levels and kinds of training institutions requires immediate attention. Enforcement legislation is no less needed for vocational training than for the schools and colleges.
5. Equality of educational opportunity for all students attending accredited schools could be partially accomplished by a uniform policy

on Federal student aid programs. Wilbur J. Cohen (27) attributed a 45 percent increase in college enrollments during the past five years, in part at least, "to Federal student aid programs". Five years ago $146 million was authorized for 255,000 students; 1967, 1,250,000 students were granted $1 billion. Such amounts have not been authorized for students attending accredited private non-profit and proprietary schools. Their only aid comes from loans under the Higher Education Act of 1965 and the National Vocational Student Loan Insurance Act of 1965; the latter is a state program with the Federal government assisting only those states that had used their funds. It is also the first effort to aid vocational education students.

If a policy were adopted of aiding any student pursuing a course in an accredited institution, such discrimination would not exist. A policy of subsidizing training and job-entry employment needs some evaluation after 5 to 10 years of student aid and manpower training programs. The price of self-respect being paid for student aid may be a high one. The high value placed on a college education has been rationalized as necessary to meet rising employment requirements. It will become increasingly evident that the standards have been unrealistic, and unreal goal aspirations have stimulated youth with low probability of success to aspire to college which has caused them to take college preparatory programs. College is expensive and becoming more expensive. With 50 percent of high school graduates going to college ostensibly to prepare for professional and managerial occupations in which only 25 percent of the labor force are employed fails to justify subsidization, especially to a greater degree than for technical and vocational school costs.

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(27) U.S. Department of Health, Education & Welfare News Release, HEW T 18, February 6, 1968.

A National Education Administration

Experience with the Rehabilitation Administration, National Science Foundation, and other similar regulatory bodies have created a precedence on a much smaller scale for a regulatory body to administer or coordinate educational activities of public and private post-secondary institutions responsible for professional and vocational education, graduate and under-graduate. Such an educational administration could be either voluntary or initiated by a Federal resolution or act. Each has its advantages. The primary difference would be the degree of authority. Whether legal or voluntary, the Board's functions and composition would be similar.

1. Its composition would be broad-based, representing all training agencies now recognized for accreditation purposes and as defined in Federal and State laws providing financial assistance to local and state educational and training agencies. Representation would include professional, management and labor associations, and representation from legislative and citizens' groups.
2. The agency would review proposed legislation and recommend needed legislation on accreditation, certification, finance, and the draft.
3. It would set up task forces and carry on continuing research, prepare materials, and serve a public information function.

4. Members of the Board would be available to consult with all local educational agencies.

It would be expected that any national body would have its counterpart in the states to insure essential communication channels, and to be sensitive to local and state needs and trends.

Legislative action at the Federal level would have the advantage of uniform operation. It would be easier and faster to initiate the program through only one legislative or executive body. The current manpower and training crisis is of sufficient gravity to consolidate operations of all state and many private agencies as has been done before.

An alternative to legislative action at the Federal or State levels would be a voluntary arrangement entered into by professional associations representing all segments of education. A first step, at least, should bring together representatives of colleges, junior colleges, business, trade and technical schools, both public and private, employer training associations, educational representatives of organized labor, National Commission on Accreditation, NEA, and its appropriate affiliated associations, the American Vocational Association and representatives from the Office of Education Bureaus of Adult and Vocational Education, and Higher Education. Such a group could survey and plan next steps. Consistent with professional and government policy, it would be most reasonable for the profession of education to initiate and operate a quasi-regulatory body to resolve some problems of cost, teacher standards, and meeting all of the educational needs in all sectors of our society, and in all geographical areas.

Many of the problems touched on briefly in this paper are sufficient for some coordinated effort, preferably by the profession, but if not, then by the government. The past ten years of rapid increase in enrollments, of much independent action and much Federal and State support cannot continue to function for another 10 years without either voluntary or mandatory action to eliminate needless duplication of effort and to insure that needed areas of quality training are available to everyone on a need basis, eliminating discriminatory practices in all sectors of the population.

The Social Bases
for the
Education of the Negro American Urban Poor
During the Next Two Decades

by

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Working Paper

for

The National Planning Association's Study

The Implications of Social and Economic
Changes for Educational Policy in the
Next Two Decades -- A Pilot Study

undertaken for

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Bureau of Research
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National Planning Association
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The Social Bases for the Education of the Negro American Urban Poor during the Next Two Decades

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I. Introduction

I. Introduction

Educational changes are coming to the Negro American urban poor. That much is certain. But will these changes during the next twenty years constitute an educational promise or disappointment? Since the poor are with us in 1968, will the poor still be poor in 1988? Will current educational ideas meet with any more social success in 1988 than those of 1948?

The purpose of this study is to examine the social bases for the education of the Negro American urban poor during the next two decades. The analysis focuses on the social system, not upon education itself. The essential questions are these: How will changes in the social system affect policy formation for Negro ghetto education? What policies will relate to what social goals? What changes in the social system will affect educational policy most? Least? Or with relative indifference?

There is something conspicuously arrogant about any attempt to grasp the entire social system. Who can honestly see it all? Whose theory of social change is conceptually rich enough to do justice to the immense realities of the Negro urban poor? Our ancient Garden of Eden myth comes back to devil us here. We "researchers" do not often choose to eat of the Tree of Life; we prefer the fruits from the Tree of Knowledge of Good and Evil. The apple we bite strengthens us "to be like the gods," to hope to know like the gods know -- all! And that is arrogance!

The only thought to temper this condition is the awareness that every approach to solving a social problem contains within it a conscious or unconscious theory of the social system and changes within it. To deal openly with an entire social system is to expose one's own arrogance conspicuously. Such exposure is risky human business. But maybe that is not so bad after all. It could lead to a correcting sense of the humble in human affairs. In the study of ghetto education, current knowledge is much in need of such a metamorphosis.

The analysis will first look at two background perspectives, relating educational policy to the Negro urban poor: (a) the relation of educational policy to social goals, and (b) the relation of social goals to social values. The main body of the study examines the effects of social change on five dimensions of ghetto education: (1) the relation of social change to the social system, (2) changes in the cultural subsystem, (3) changes in the social subsystem, (4) changes in the psychological subsystem, and (5) changes in the physical subsystem. The study concludes with a statement of the implications of the projected social changes for the establishment of a permanent center for educational policy research.

II. Background Perspectives: Educational Policy Planning for the Negro Urban Poor

A. Relating Educational Policy to Social Goals.

B. Relating Social Goals to Social Values.

II.

A. Relating Educational Policy to Social Goals.

A. Relating Educational Policy to Social Goals

The immediate future of urban education for the poor lacks many things, but not ideas. The professional literature is loaded with ideas -- including good ones. Considerable wisdom is alive within the ghettos, as well. In recent interviews with teenage dropouts, confined to the "Basic Track" of the Washington, D.C. school system, there wasn't a single idea in the Moynihan and Coleman reports upon which the ghetto youth did not touch in their own language and at their own initiation.(1) Ideas abound...and go pogo-sticking through the social system with increasing visibleness and ease.

Ideas have already landed within our society in discernable patterns and coalesced into well-established assumptions. These patterns and assumptions take the form of a conceptual paradigm, relating basic social structures to general social goals for the urban poor. More than that, the paradigm contains within it embryonic sets of priorities. True, this conceptual paradigm has not yet grown into an operational model, but it clearly points in that direction.

What exists now, and is more broadly accepted than may be realized, is the following relationships of ideas, presented in schematic form. The representation relates directly to the socio-economic life cycle of the Negro American urban poor.

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(1) Interviews with teenage ghetto residents at the Fides Neighborhood House, Washington, D. C., August 1967, by David N. Ruth.

The Socio-economic Life Cycle: Schematic Representation (2)

(BASIC SOCIAL STRUCTURES)	(GENERAL SOCIAL GOALS)
	Improving:
Family Background →	Life chances
↘ Schooling →	Level of living.
↘ Job →	Health, welfare.
↘ Income →	Status, acceptance
↘ Expenditures →	Satisfaction, morale.

The primary value of this socio-economic Life Cycle is its relating general social goals to basic social structures on a priority basis. These priorities present the urban educational policy planner with the interaction of two strategic variables: (1) basic social structures, and (2) general social goals.

1. Basic Social Structures

From the viewpoint of basic social structures, the paradigm tells the educational analyst planning for the immediate future that:

(a) Family background - the family affects all other social institutions and structures causally, and with ever narrowing areas of choice. This means that the family decisively determines success in education; education, in turn, decisively determines success in employment, etc. Evidence for this comes from many studies of the effects of family structure on education among non-white groups. Recently, the Educational Opportunities Survey summarized its first three findings in this manner:(3)

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(2) Otis Dudley Duncan, "Discrimination against Negroes", The Annals, Vol. I - Social Goals and Indicators for American Society, Philadelphia: The American Academy of Political and Social Science, May 1967, pp. 87 f.

(1) "Family background was most important for achievement."

(2) "The association of family background with achievement does not diminish over the years."

(3) "The influence of school facilities, curriculum, and staff that is independent of family background is small."

(b) Schooling - success in education is determined largely by attitudes and motivational patterns born, nurtured, and maintained by the family. Even under "ideal" educational factors, family socialization proves the decisive influence on pupil achievement.(4) The level of education similarly determines the degree and kind of employment open to the school survivor.

(c) Jobs - positive correlations exist between formal educational achievement and success in employment. Likewise, those who are deprived most by the family and educational institutions become the most frequently un-and-under-employed.

(d) Income - income, in American society, remains tied to successful work performance. In social terms, this means that a fundamental problem of the poor is that they need money. However simple that sounds in writing, it nevertheless still remains far beyond much of the middle class in understanding.

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(3) George W. Mayeske, "Educational Achievement Among Mexican-Americans: A Special Report from the Educational Opportunities Survey", Division of Operations Analyses, National Center for Educational Statistics, Office of Education, Department of Health, Education, and Welfare, Technical Note No. 22, January 9, 1967, p.9.

(4) James S. Coleman, et.al., Equality of Educational Opportunity, Washington, D.C., Office of Education, Department of Health, Education and Welfare, 1966, pp. 21, 22.

(e) Expenditures - without income, individual and family expenditures remain inefficient, insufficient, erratic, immediate, and unplanned. The net result is psychological and social disruption, at both the individual and institutional levels of analysis.

Available data from various branches of the social sciences convincingly places the Negro American in a very visible spot within this paradigm. The extant information makes clear that Negroes, "in disproportionate numbers,(5)

(1) experience unstable family structures and depend on meager family resources,

(2) attain less than average amounts of education,

(3) are employed in lower level jobs,

(4) secure low incomes,

(5) have an inefficient pattern of expenditures."

Analytically, each of these deprivations sets off a chain reaction of future deprivation for the Negro American poor. This description of the Negro American has been known to social scientists for several decades. What is new are the attempts to relate these social facts to general social goals.

2. General Social Goals

From the viewpoint of general social goals, the following pyramid emerges. It suggests, in broad terms, the limits and scope of those institutions affecting social stability and social change.

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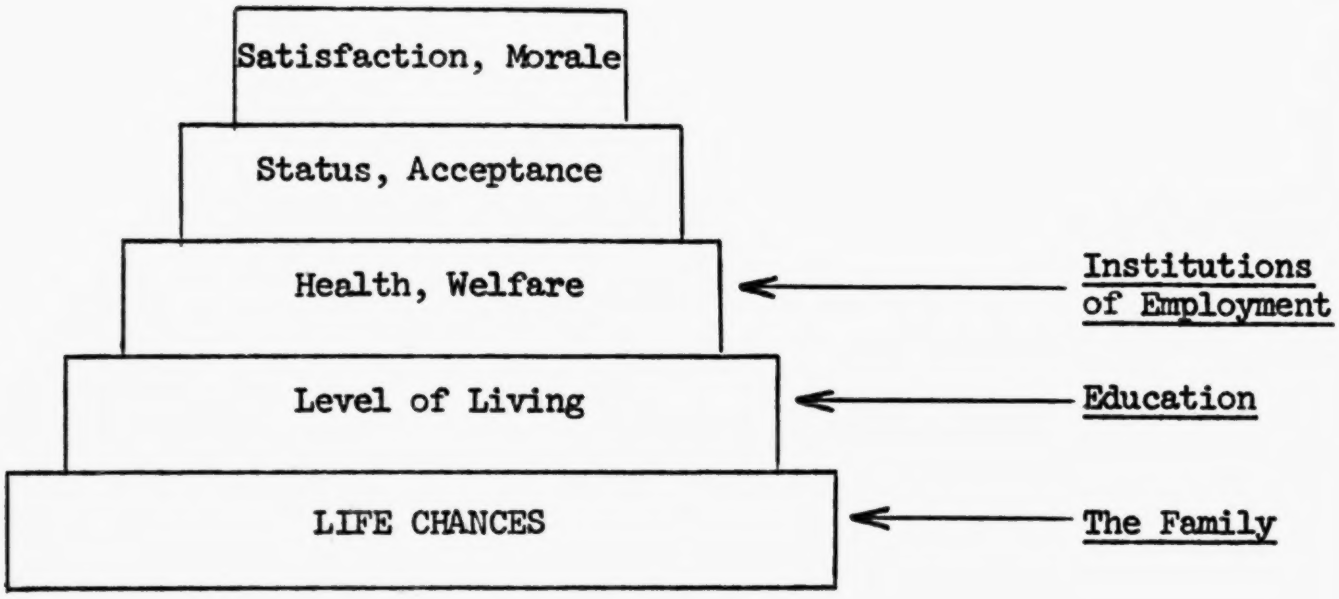
(5) Otis Dudley Duncan, loc. cit., p. 88. See also the Moynihan Report for supporting documentation, The Negro Family: The Case for National Action, Office of Policy Planning and Research, United States Department of Labor, March 1965...specifically his conclusion that, "at the heart of the deterioration of the fabric of Negro society is the deterioration of the Negro family."



More significantly, these social goals suggest priorities for the policy planner concerned with urban education in the immediate future. Much more specificity will be required -- on the basis of long-term, not one-shot, research. But ideas already exist for educational policy planners to begin.

(a) Improving Life Chances

If it is the primary social goal of the educational policy planner to "improve the life chances" of the Negro urban poor, the place to begin is not the educational institutions themselves, but the family. The implications of such a policy for educational institutions are certainly immense -- even though only partly perceived. Far from putting educational institutions out of the urban business, a focus on the urban poor family by education would necessitate most interesting program changes, as well as new directions for educational institutions themselves.

For American society to come to terms with Negro urban poor families as the primary area of socio-economic change requires not so much innovation as is frequently believed. Here, again, ideas are not lacking. Decades ago, Gunnar Myrdal wrote in An American Dilemma that the "Negro problem" is no Negro problem at all, but primarily a white man's problem. His point was that, since the white middle class so thoroughly dominates American society, it must be in large measure responsible for the existence and maintenance of the "Negro problem". To this day, no one has considered studying on similar scale "The White Family" as it specifically relates to the perpetuation of Negro family disintegration.

Any change in policy toward viewing the family as the primary institution promoting socio-economic change would send education researchers back to Myrdal for a more manly look. In Robert Bierstedt's professionally lonely but sensible view, we still seem to believe that(6)

> "to understand anti-Negro prejudice we (must) spend vast amounts of money and energy studying Negroes...Thus for some reason, we assume that if Group A is prejudiced against Group B, there must be something in Group B to account for the fact."

That assumption might be true. But "upon reflection, it seems more likely that the cause of the prejudice is to be found in Group A. It is this group, after all, that owns the prejudice and that does the discriminating."(7)

An educational policy aimed at enlarging the "life chances" of the Negro urban poor would certainly have to look carefully at the White Family.

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(6) Robert Bierstedt, The Social Order, New York: McGraw Hill, 1963, p. 480.

(7) Ibid.

We still do not know what makes the white man so stubborn, so indifferent, and so dogmatic in his approaches to the Negro urban poor. That question, at least, requires a white man's look. How to alter the white family prejudices on this issue could conceivably require a thorough overhaul of white man's educational systems.

If education perceives its primary social goal as improving the life chances of the Negro American urban poor, the place to begin is with both the Negro and the white Family. Such a goal would require educational policy research affecting the entire institution of the American family, with particular attention to the structures and functions of the Negro family in the urban ghetto.

(b) Improving the Level of Living

If, however, the social goal of educational policy planners is the improvement of the "level of living" among the Negro urban poor, the focus is on the educational institutions themselves. Although more modest and limited in impact, no one claims that ghetto schools could not benefit from massive improvements in all their dimensions. The quality of education in the ghetto schools certainly affects socio-economic changes, as the paradigm suggests. But its effect is limited to those who receive educatable support from their family nucleus. The French have an apt phrase for this point, definitely open to study by the United States educational planners. It is "la famille éducogène," referring to families who provide their children with an educational environment moving in the same social and intellectual directions as that exerted by the schools.(8) Parental attitudes running contrary to those of educational institutions affect students adversely, even under the best educational situations.

Nevertheless, within the Negro urban group, the "level of living" could be raised for many more people than the current educational system allows. To cite just one example, which regrettably is not isolated, about a recent ghetto school graduate. After receiving her diploma, the young Negro girl applied for a position with the telephone company in Washington, D. C. She immediately failed the initial qualifying test. Within less than two hours of personal instruction at the Fides Neighborhood House, a community worker taught her how to take a test. The next day, the girl returned to the telephone company and passed the examination.(9)

The illustration says, at least, that educational institutions in the ghetto can do much more to raise the "level of living" for Negro youth. It also opens the possibility that more motivation for education exists among the Negro poor than middle class education often assumes. In any case, improving the "level of living," through direct changes in the educational institutions affecting the Negro urban poor, offers the policy planner immense responsibilities and innumerable possibilities for research.

(c) Improving Health and Welfare

If the social goal of educational policy planners is to improve specifically the "health and welfare" among the urban poor, the institutions of employment are the place to begin. Positive correlations between health-welfare and employment have been known to social scientists for many years. No discussion of the subject fails to establish the inferior state of health and welfare for the under-and un-employed.

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(8) A. H. Halsey, (ed.), Ability and Educational Opportunity, Organization for Economic Cooperation and Development, 1961, pp. 100-105.

(9) Reported in interview by D. N. Ruth with members of the Fides Neighborhood House, Washington, D. C., August 11, 1967.

The paradigm issues a warning to policy planners, however. It says that even under the best vocational education conditions and under the finest business-industry relationships with the schools, the social results will be limited. The limit exists because employment possibilities for ghetto youth presuppose attitudes toward work, social interaction patterns, capacities for personal planning, postponement of gratifications, and maintenance of responsibilities -- all developed in the family and enlarged by general education.

For those already "socialized" by the family and educational institutions, employment is definitely the key for the improvement of health and welfare for the urban poor. This analysis in no way minimizes the importance of relating employment institutions with education. It only suggests that success, in improving health and welfare through employment, will be confined to those ready to assume such social responsibilities.

That many are more ready for employment than opportunity currently allows requires no debate. Planners in vocational education and in federal-business-industry-education cooperation are in no danger of running out of work. But more should not be expected from meeting this social goal than an educational-employment policy can promise.

(d) Improving Status, Acceptance, Satisfaction, and Morale

To improve the "status, acceptance, satisfaction and morale" of the Negro poor is a dearly beloved goal of most members of our society. It inspires good will, charity, voluntary action of the noble kind. However, its impact is temporary and its ideational base bankrupt.

Since status and acceptance are so highly correlated with income in American society, an educated middle class which allows for no more than subsistance welfare (or income) is worse than a solution. It, in fact, confirms and perpetuates a low status and non-acceptance among the urban poor and between the social classes. It is based on a policy of institutional charity -- doles out of middle class abundance. It has nothing to do with the sturdier policy of institutional and educational justice. And for the urban poor, nothing less will suffice.

Psychologically, satisfaction and morale are similarly related to expenditures, in statistical terms. But these relationships can and do appear only on tables, charts, and graphs. It can go no deeper than that. Expenditures which come from gifts of charity involve slippery psychological processes. Gift-giving, even without strings, is no mean accomplishment for any of us. Few have learned to impart self-respect through a gift of money or material. The beggar may take the coin, all right. But no one need be fooled that he does not resent his situation -- and often hates the ones able to give what he has not.

As a behavioral statistic, it is true that what a man spends his money for is a sign of what comes from the "heart". But welfare doles always come first from other people's pockets. They do not come from within the man. An educational policy designed solely to raise the status, acceptance, satisfaction, and morale of the Negro poor, though increases income and expenditures, is at best temporary in impact. More likely, it would be a Victorian hangover of charity, in an age when that idea is no longer adequate.

The paradigm suggests that the best ways of relating educational policy to social goals, affecting the Negro urban poor, is to begin at the beginning -- with the basic institutions of the family, education, and employment.

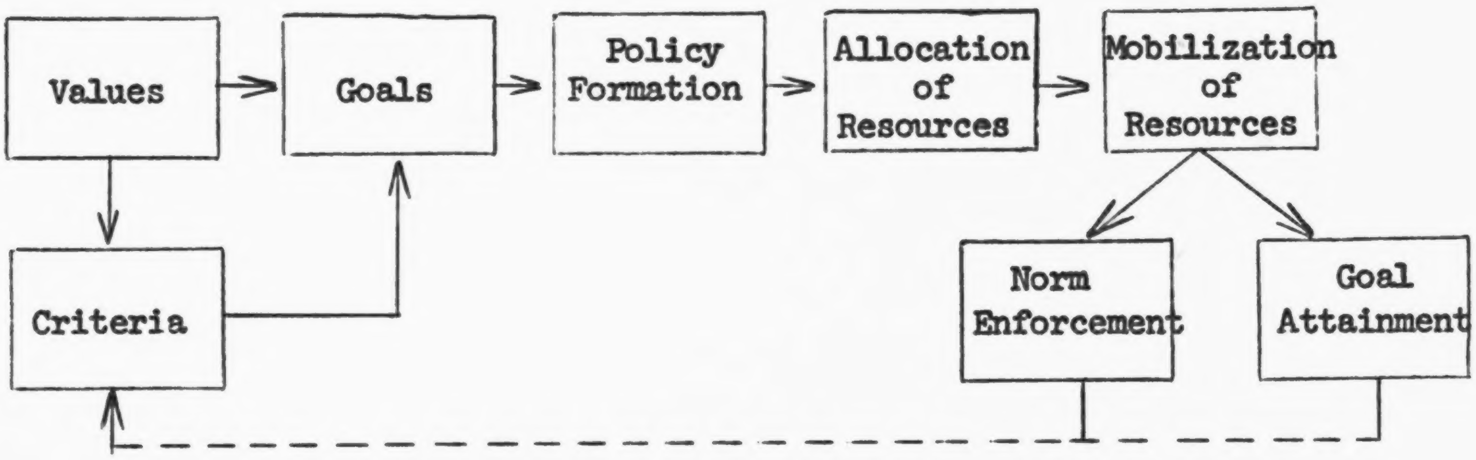
II.

B. Relating Social Goals to Social Values

B. Relating Social Goals to Social Values

When the educational analyst tries to relate social goals to social values, he comes upon all-but-barren land. Here, ideas do not abound. They are, in fact, rare. What we find in abundance, however, are endless check lists of values and long-winded enumerations of traits -- all born out of personal guesswork. There is absolutely nothing wrong with lists and enumerations; much wisdom may be contained in them. But unfortunately, for analytical purposes, their reliability in research reaches zero at best. A zero, or chance, correlation does tell us something, but for the planner -- not much.

At the highest level of abstraction, the logical relationships between values, goals, and policy are known. Though they come in many sizes of boxes, circles, rectangles, and even diamonds, they generally look like this:(10)



The main point of this scheme is that values enter into every level of social structure, and, in particular, constitute the primary source of goals and criteria for policy formation. Beyond this awareness, not much is certain.

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(10) The scheme is that of Robin M. Williams, Jr., "Individual and Group Values", The Annals, Vol. I - Social Goals and Indicators for American Society, Philadelphia: The American Academy of Political and Social Science, May 1967, p. 27.

1. Barriers to Logic

To move toward more specificity and reliability in this area, the policy planner will first have to make three leaps toward logic. He will have to jump the barriers which have tended so far to make the study of social values (1) de-historicalized, (2) de-socialized, and (3) de-localized. The hope for such leaps is to find those strategic variables by which values and goals can be related analytically to policy formation, affecting the education of Negro ghetto youth. But first, a brief look at the barriers.

(a) De-historicalized Values

It might be hard to swallow, but educational sociologists have not yet taken history seriously in the study of values. Too much writing in the area of social values sounds as if Max Weber never lived. When one looks at current United States cross-cultural programs affecting Asian education, for example, it appears that we build schools in Thailand the same way we do in San Francisco, the Kansas plains, Philadelphia suburbs, or, for that matter, on the planet Pluto. The history of each culture and sub-culture seldom appears, and only by accident influences policy planners.

A personal illustration might ease the pain a bit. I recently had the opportunity to talk with very aboriginal Laotians in a village north of Vientiane. The State Department's Agency for International Development had wanted to build a water storage facility along the village riveron a "self-help" basis. Expensive equipment and personnel from the

States arrived, elaborate surveys completed, plans formulated, and a site chosen. All this outburst of energy convinced our people that success was certain. But when the time came for action, the Laotians flatly refused to help.

No amount of argument, reasoning, and even badgering moved the Laos, who were summarily dismissed as lazy, ungrateful, unproductive people. The trouble, however, was too simple for our experts to see. For the Laos, the sacred spirit, named Pi, lived in this spot along the river. It was his home and their altar. Having dismissed this part of their cultural history as non-scientific superstition, the American engineers had no interest in learning or listening. And for the Laos, they were far too shy, and wise, to mention it to those who would only laugh.

Ironically, the local Lao shaman could easily have moved Pi down stream to another home, if respectfully approached. That would have been no more difficult than asking a Christian priest or Jewish rabbi to move his altar to unearth a vital sub-terranean stream, rather than drill through it _in situ_. But in jumping cultures, we became de-historicalized. We could not take their history seriously, because we clutched our own value system too rigidly.

The point of this goes right to the heart of ghetto education. To plan for Negro urban education with a set of white middle class values takes neither's history seriously. There exists within the ghetto a sub-culture most worthy of listening to and learning from. Whenever policy planners assume that everything in the ghetto is bad and its people lazy, etc., they have said no more than that everything in a non-middle class culture is non-middle class in culture. To begin with, that is a meaningless statement.

The first barrier to overcome in the area of social values is to look at Negro ghetto culture with a sense of history. This means that every known element of culture receive a fair hearing -- language and language use, expressive symbolism, cognitive factors, basic beliefs, and value systems themselves, to mention just the head-line essentials.

To my knowledge, that Laotian water storage facility has never been built. It could have been, though. All it takes is to discover the "sacred spirit" in the other man with that other cultural history.

(b) De-Socialized Values

Values not only spring from particular cultures, they also exist within particular societies and social groups. There is no such thing as a living value in non-social soil.

American agricultural experts, for example, have developed a rice seed that yields four times as much rice in Asian soil than is currently in common use there. All Asian farmers contacted seem to welcome this innovation, but with varying results. The Laotian farmer takes the seeds with much gratitude...and then goes out to plant no more than one-fourth his field. When it is explained that he could produce more rice at profit, he smiles and asks, why? "When my daughter gives birth, then I'll plant some more seeds; until then I am happy with my little field," he explains in return. Apparently the midwestern and Laotian farmers have different social values. And in this instance, who is sure whether "profit" or "happiness" grows the greater human yields.

We have much to learn about implanting middle class values in lower class soils. True, we live in a middle class society, so all must somehow be equipped to survive in it. But it does not follow from this that what is good for the middle class is good for all other classes. Regrettably, the concept of "lower class" seldom makes it in print these days. The reasons are clear enough. "Lower" sounds too much like"inferior", rather than the socio-economic designation intended. The result of this semantic omission, however, is a dangerously faulty formulation of the ghetto problem. It is currently acceptable to talk of "middle class", so middle class is compared with the Negro, or the Negro family, etc. This means that "class" is compared with "race." Not "class" with "class"! And race with race!

Semantics are not important here. What does matter are logical and empirical conceptual confusion which undercut meaningful social class and race analysis. "The Negro problem" in America involves both class and race dimensions. Class, after all, is related to social status, and statuses ranked differently by the juxtaposition of groups in some order of rank. Analytically, class and color are independent. This will have to be untangled before social values and goals can inspire and guide the educator in the realm of policy formation.

The point at which color does relate to class in our society lies at the level of social mobility. Color blocks vertical social mobility, or seriously impedes it. This is what sociologists call "the closed class" or "caste system". It is necessary to remember, however, that castes (closed class systems) can and do exist without racial overtones, e.g. Indian castes and religious castes among black Nigerians. Furthermore, within every class (open and closed), there exist certain groups of people who remain essentially "classless" -- such as artists, writers, scholars, and sometimes babies, who are freer to move socially among all classes.

Any analysis of social values for the Negro urban poor will require that logical and empirical distinctions be "held firm" -- between what are "class", "race", and relatively "classless" phenomena. A de-socialized approach to ghetto education offers little of enduring value to policy planners. Taking social classes and groups seriously, however, promises to unearth social values that will yield the policy planner far more than four times his current productive effort. He just might learn how to make the would-be "productive" class "happy", and the would-be "happy" class "productive". Such a goal is a not-so-classless value, at that.

(c) De-localized Values

One of the main reasons that social value studies seem so thin in substance is that they are imbued with a "delocalized mentality", to borrow Karl Mannheim's delightful phrase. The existing lists of values simply have no contact with the locality in which they live and move, and purportedly operate. Social scientists no longer believe that values fall out of the sky from heaven and land on earth. But neither do values drop down from Washington, academia, and Wall Street on to the local communities below. Nothing impedes the serious study and application of social values to policy formation more than the delocalized manner in which values are perceived.

Values do have cultural and class bases, and must be analyzed at those levels. But values also are born, grow, and exist in localities -- in local communities. Far from being the smooth, ethereal, spiritual vapor in which values are often dressed by academic scholars, values are, in fact, the knobby, earthy, gutty flesh of daily living in a very real locale. Ask any ghetto youth what he wants, and you will hear what he values. The belief that localized values are hard to find is a myth. They are not. Social values jump at any student right on the streets, provided, of course, the analyst has been willing to lose his delocalized eyes and ears...and dares see it "like it is."

Sociologists have warned for some time that what is "true" for the middle class in New York City may not be true for the same class in Chicago, Mississippi suburb, or Idaho farm. The missing variable, here, is the local community. Not all values carry over from one community to another, even within the same class and same culture. The local community is not a microcosm of the entire society, as is sometimes assumed. American society is far too mobile, complex, and varied for that kind of faulty assumption. The local community exists as an alive social organism, requiring the careful attention it deserves.

Ghetto education also takes place in particular local communities, each with a life and value system peculiarly its own. One of the most promising experiments in building social policy within a local community is the ECCO Neighborhood Corporation of Columbus, Ohio.(11) ECCO is a democratically structured, self-governing, local community corporation, funded by the Office of Economic Opportunity in cooperation with a local religious group.

ECCO grew up in a ghetto neighborhood of 5,000 people in 1965. From Washington came the impetus for local planning in the fertile mind of Milton Kotler of the Institute for Policy Studies. From Columbus came the willingness of a Lutheran Church to sink or swim all the way with a slum community. And from the local people themselves came the dominant leadership.

In addition to a professional staff, ECCO employed forty ghetto residents as community workers, early in its existence. More and more, local residents took over the formal leadership. In so doing, they identified the living social values within the ECCO purviews, clarified their own social goals, and developed educational policies of immense significance. One of the many exciting policies led to assigning parolees and dropouts, not to individuals, but to the Neighborhood Community Center itself. In this way, the local community assumes responsibility for local action. In addition, it shows ghetto youth real ghetto adults acting in socially constructive ways.(12) As a basic socialization process, that is hard to beat.

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(11) ECCO stands for "East Central Citizens Organization".

(12) Reported and evaluated by Tilden H. Edwards, Executive Director, the Metropolitan Ecumenical Training Center, Washington, D.C. in an interview with David N. Ruth, August 9, 1967.

"National" planning for "local" planning constitutes one side of the coin which opened the ECCO box to relating community values to social goals and policy formation. The other side was the early and permanent inclusion of ghetto adults and ghetto youth in policy formation itself. Come to think of it, that is a pretty good formula for the Center for Policy Research in Education, itself -- (1) centralized planning for de-centralized leadership, and (2) early and permanent inclusion of ghetto residents on the staff of the Policy Research Center. (It may even by a good idea for the review panels of this National Planning Association, project, as well)

One of the most common complaints about ghetto education is its purported domination by a middle class leadership unable and unwilling to listen and learn from a ghetto locale. The complaint means to local residents that ghetto education is still imbued with a delocalized mentality. One of the easiest ways to expand the leadership roles, and to minimize middle class domination, is to open the doors to community participation in the policy formation of local ghetto education. According to Dr. John Dillingham, Director of the "Personal Growth and Development Program" in a Washington, D.C. ghetto summer project, his most valuable teacher is a young dropout, born and educated in the local ghetto. His value lies in his capacity to tell it "like it is". (13) That means, to begin with, the absence of delocalized values and the presence of local community leadership.

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(13) Reported in interviews with Dr. John Dillingham of Georgetown University, Washington, D. C. by David N. Ruth, August 11, 1967. The name of the young ghetto leader is Melvin Green of Washington, D.C., also interviewed, August 17, 1967.

2. Strategic Variables

The purpose of the foregoing analysis was to nudge researchers into removing the sociological cobwebs from their analysis of social values. Behind each barrier discussed lies a strategic variable, absolutely essential to the analysis of social values and their relationship to social goals and policy formation.

Out from under de-historicalized values emerges the dimension of "culture". Beneath a de-socialized analysis, the variable of "class" comes forth. Throwing out a de-localized mentality allows the "community" to appear in its strategic relation to value and goal analyses. With a bit of embarrassment aboutthe alliteration of the result (it was not deliberate, I swear), these three strategic variables emerge:

a. Culture
b. Class
c. Community

The next step for research is the construction of matrices which show the logical relationships of particular social values to culture, class, and community. Then, to relate each of these strategic variables to urban social indicators which can be quantified and put to empirical tests. With the benefit of such information, social goals can be constructed in a living social context and policy appropriately devised.

The construction of matrices has currently out-run theoretical justifications, however. So many exist in the sociological literature, that the tendency has been to give up on them all -- and start afresh. Daniel P. Moynihan seems to have done this in his recent article on guidelines for the construction of social indicators. He prefers that social indicators be developed from three simple bases: (1) the individual, (2) the family, and (3) institutions.(14) There is certainly much to be gained from this more simple and provocative approach.

Table I shows a matrix for the analysis of a social value, and its derivative social indicators and goals, more akin to my liking. It maintains a degree of simplicity in its focus on culture, class, and community as strategic variables, each approached from the individual and institutional dimensions. It then seeks to relate these variables of social values to a structural and functional analysis within the social system. After an empirical analysis of social values, the expectation is that social indicators and goals can be deduced on the logical ground of content analysis. At least one of the main difficulties with this particular matrix is that it has not yet been put to, or survived, an empirical test.

All matrices must face the empirical crucible before any assessment about their reliability and validity is possible. Unfortunately at the present state of sophistication in the social sciences, neither theoretical nor empirical logic is analytically sufficient to avoid many years of intense

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(14) Daniel P. Moynihan, "Urban Conditioner: General", The Annals, Vol. I -- Social Goals and Indicators for American Society, Philadelphia: The American Academy of Political and Social Science, May 1967, pp. 159-177.

TABLE I

Matrix for the Analysis of a Social Value

Social Value (e.g. = "Progress")	Culture		Class		Community	
	Individual	Institution	Individual	Institution	Individual	Institution
A. Structural Analysis: 1. Diffusion - Specificity.						
2. Affectivity - Neutrality.						
3. Universalism - Particularism						
4. Quality - Performance.						
B. Functional Analysis 1. Pattern Maintenance and Tension Management.						
2. Adaptation						
3. Goal Attainment						
4. Integrative						
C. Social Indicators						
D. Social Goals						

give-and-take interaction. It is a safe guess that many changes will be made before that goal succeeds.

In the meantime, much can be gained by taking an analysis of social values and social goals into the daily life of a culture, class and community of persons.

III. Social Changes Affecting Ghetto Education.

A. Social Change and the Social System

B. Changes in the Cultural Subsystem

C. Changes in the Social Subsystem

D. Changes in the Psychological Subsystem

E. Changes in the Physical Subsystem.

A. Social Change and the Social System.

A. Social Change and the Social System

The reason why man looks at future social change has itself changed. Our old cultural adage said -- the importance of studying the present is what we do with it in the future. Today we say -- the importance of looking at the future is what we do with it today. We study 1988 to act in 1968.

Social change for ghetto education during the next two decades has, therefore, nothing to do with predictions, prophecy, or a parrot-like repetition of other people's forecasts. It is first and last a projection, i.e. making conditional statements about future trends on the basis of present-day assumptions. The hope of a 1988 projection is to show what can be done in a 1968 Policy Planning Research Center, and, when possible, to guide contemporary policy researchers by articulating priorities. An additional bonus of looking at 1988 is that we may gather courage to overcome that individual and collective "failure of imagination",(15) which characterizes so much Negro American ghetto education today.

The social goal of projection, then, is the development of planned educational change. To accomplish this, social change is projected within the context of the social system. For analytical purposes, the social system consists of four primary subsystems: (1) cultural, (2) social, (3) psychological, and (4) physical. Table II lists those aspects of each subsystem considered particularly relevant to an analysis of the social system's effect on planned

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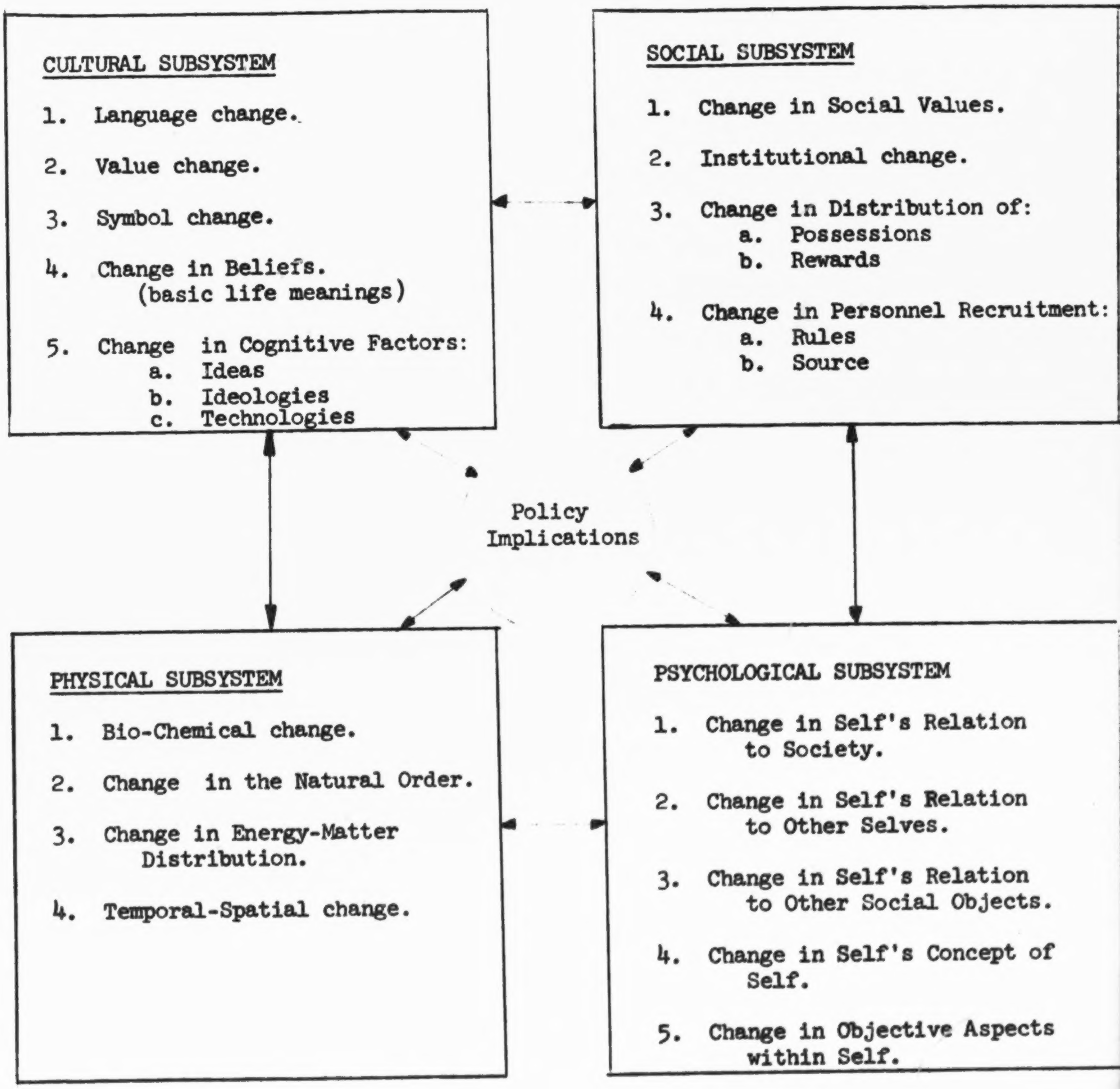
(15) A common cultural phrase, but one used with particular cogency by Dr. John Dillingham in his work and evaluation of ghetto education in Washington, D.C. -- during interview in August 1967 by David N.Ruth.

Table II

SOCIAL CHANGE AND THE SOCIAL SYSTEM



CULTURAL SUBSYSTEM

1. Language change.
2. Value change.
3. Symbol change.
4. Change in Beliefs.
   (basic life meanings)
5. Change in Cognitive Factors:
   a. Ideas
   b. Ideologies
   c. Technologies

SOCIAL SUBSYSTEM

1. Change in Social Values.
2. Institutional change.
3. Change in Distribution of:
   a. Possessions
   b. Rewards
4. Change in Personnel Recruitment:
   a. Rules
   b. Source

PHYSICAL SUBSYSTEM

1. Bio-Chemical change.
2. Change in the Natural Order.
3. Change in Energy-Matter Distribution.
4. Temporal-Spatial change.

PSYCHOLOGICAL SUBSYSTEM

1. Change in Self's Relation to Society.
2. Change in Self's Relation to Other Selves.
3. Change in Self's Relation to Other Social Objects.
4. Change in Self's Concept of Self.
5. Change in Objective Aspects within Self.

educational change. The social system, here, is an action system. This means that each subsystem and its many subdivisions constantly interact with each other. Understanding the nature of that interaction elicits the content of projected social change, and leads to policy implications -- the particular focus of this social system analysis.

Any projection concerning future social changes contains assumptions about the rate of that change. And this study is no exception. One can postulate generally slower, similar, or faster rates of social change, in comparison with the present. This particular analysis proceeds on the assumption that during the next twenty years, the general rate of social change will be similar to that of the last twenty years. This means there will continue to be considerable social changes in many dimensions of the social system, but no general radical acceleration or reduction in rate.

The assumption of general continuation in the rate of social change is based on the belief that our society will remain a basically "pragmatic conservative" one in its value systems. A conservative society is, after all, what we are -- one in which the vast majority of people have many things and much of value to conserve. Also, our historical commitment to "this-worldly", "activitistic", "non-consummatory" values, as analyzed by Talcott Parsons, suggests that our traditional "pragmatic" readiness for social exploration, progress, and change will continue.

With reference to ghetto education, specifically, this means a generally slower rate of change in most areas, compared with society-at-large. Three reasons for this assumption are offered by G. Franklin Edwards:(16)

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(16) G. Franklin Edwards, "Community and Class Reality: The Ordeal of Change", Daedalus - The Negro American - 2, Journal of the American Academy of Arts and Sciences, Winter 1966, pp.17-21.

(1) "The opposition to change by segments of the white community".

(2) The "inherent" nature of the problem - "The accumulated disabilities of the Negro family, and in individuals in terms of inadequate education, job skills, housing, patterns of dependency, and low self-esteem".

(3) "The attitudes held by certain Negroes who either have a vested interest in segreation or are generally fearful of the deleterious consequences desegregation will bring".

In addition, social problems in our society have most often met with a typical pattern of change, whether in dealing with women's voting rights, labor legislation, or medicare. First, the opposition denies the existence of a problem. After that fails, second, the argument goes that the proposed remedies would cause greater evils than the problems they are designed to solve. The third reaction, after the first two no longer make sense to the majority, is the rear-guard, or slow retreat. The opposition puts forth proposals of its own to meet token and partial aspects of the problem they previously denied existed. (For example, the voluntary health insurance plan of the American Medical Association after years of denying a problem existed in the first place). There is no indication in sight to suggest that the problems of urban ghetto education will jump over our typical pattern of social change. Most likely, the Negro ghetto will continue to be last, in benefiting from technological, financial, and philosophical change. In any case, these are the assumptions underlying the following projections.

Table III presents the matrix in which the projections are made. It places the dimension of change in the social system, previously described in Table II, in juxtaposition with the basic social structures of the (1) family, (2) education, and (3) employment (analyzed in Section II-A), each with special attention to the strategic variables of "culture", "class", and "community" (Section II-B). No pretense is made that any one person, or group of persons, is sufficiently informed to fill all these boxes with animating truth. For ghetto education, that very possibility sounds a bit presumptuous.

True, many ideas are stirring concerning the role of education and social change.(17) But with Negro ghetto education, in no dimension is either the necessary or sufficient knowledge in force. The subject simply has not been taken seriously by a large enough segment of society for a long enough time. The hope in the following discussion is to suggest what concentrated policy research could accomplish.

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(17) Donald A. Hansen and Joel E. Gertsl, (eds.), On Education - Sociological Perspectives, New York: John Wiley and Sons, Inc. 1967. (See particularly chapter 3, "Education and Social Change", by Reece McGee, pp.69-104.)

Table III

Matrix of Social Change Affecting the Education of the Negro American Urban Poor

Dimensions of Change in the Social System		Family			Education			Employment		
		Culture	Class	Community	Culture	Class	Community	Culture	Class	Community
CULTURAL Subsystem										
1. Language	cultural change									
2. Values										
3. Symbols										
4. Beliefs										
5. Cognitive Factors										
SOCIAL Subsystem										
1. Change in Social Values										
2. Institutional change										
3. Change in Distribution										
4. Change in Personnel Recruitment										
PSYCHOLOGICAL Subsystem										
1. Change in Self's Relation to Society										
2. Change in Self's Relation to Other Selves										
3. Change in Self's Relation to Other Social Objects										
4. Change in Self's Concept of Self.										
5. Change in Objective Aspects within Self.										
PHYSICAL Subsystem										
1. Bio-chemical change										
2. Change in the Natural Order										
3. Change in Energy-Matter Distribution										
4. Temporal-Spatial change										

B. Changes in the Cultural Subsystem

B. Changes in the Cultural Subsystem

Five dimensions of culture will be projected. These are: (1) language change, (2) value change, (3) symbol change, (4) change in beliefs -- basic life meanings, and (5) changes in cognitive factors. Each dimension focuses upon only three, among many, social structures of the ghetto -- the family, school, and employment. Where sufficient empirical knowledge exists, they, in turn,will be examined with particular attention to the variables of ghetto sub-culture, class, and community.

1. Language Change

Words, or verbal symbols, constitute fundamental units of language. But there is much more. A language contains a life style all its own -- with forms, structures, a sense of time and space, rhythms, movement, and dynamism, to mention only a few factors. Spoken language has been, and will remain, a prime indicator of class identity. Listen to a man speak, and you will know -- not always where he comes from -- but always his relative class rank in society. When Professor Henry Higgins took on the Cockney-ed Eliza, he changed more than an accent. He dared to change an entire life style.

Ghetto language, like Cockney, belongs to a sub-culture with an integrity its own. It reveals a class designation with a rank its own. And it speaks of community with a locale its own. In the context of American English, the Negro ghetto resident speaks a non-standard language. "Non-standard" does not mean illegitimate. As a language, the non-standard Negro ghetto tongue is far more dynamic and creative than current standard English. Negro ghetto language is legitimately born in the family and grows up on the local streets. But take it into a middle-class oriented classroom or a middle-class oriented employment office, and you have had it.

According to Dr. Charles Hurst, Jr. of the Howard University Speech Department, "... The fact is that the nation badly needs an overall program for 'bridging the cultures'."(18) This includes the training of middle class teachers in the ghettos to understand, appreciate, and speak non-standard English, and the teaching of standard English to ghetto students on the basis of respect for their non-standard speech. Currently, about twenty million Americans speak a non-standard language (including Indians and citizens of Spanish origin). The twenty-year projection is that this number will grow with the population, while remaining constant in percentage terms for Negro Americans.

Negro Americans will not lose their non-standard language by 1988 primarily due to psychological reasons. Unlike the German and Italian Americans, the Negro does not begin with enough pride in his cultural heritage. Language assimilation of other ethnic tongues occurred only *after* the full experience of psychological pride has exhausted itself -- and then only in third or fourth generations. During the next two decades, the Negro American urban poor will require skills in standard English and respect for his non-standard tongue. More than that, he needs to experience pride in both, before he can give up either.

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(18) Charles Hurst, Jr., Chairman, Department of Speech, Howard University, Washington, D.C. Reported in the "Washington Post Parade," *Washington Post*, June 11, 1967. See also Paul Lerman, "Argot, Symbolic Deviance and Subcultural Delinquency," *American Sociological Review*, Vol. 32, No. 2, April 1967, pp. 209-224.

Recognition of the language factor by educational institutions can be expected to grow and succeed during the coming decades. For those ghetto students sufficiently motivated to benefit from such instruction, the doors to employment and career development will open a bit wider. But during this period, the Negro ghetto family will receive only side benefits from this change. By 1988, new Negro families will begin to emerge in which bi-lingual respect is born. The crucial factor, now, is educational policy. Will it perceive, on a wide enough scale, the importance to psychological pride and employment opportunity of including non-standard English in its Teacher Training and Student Curriculum plans? The assumption is that it will.

2. Value Change

At the cultural level of analysis, values can change in their consistency of application, their priorities of acceptance, through the result of value conflict, or through the appearance of a new value or the death of an old one. Such a typology by no means exhausts the possibilities of value change. Each of them does apply, however, to life in the Negro ghettos during the next twenty years. One example of each type follows:

(a) Change in consistency of application:

"Achievement" (18a)

One of the most dearly beloved values in American culture is "achievement". It has ruled supreme since the Pilgrims first planted five kernels of corn, with thanks to God for the rewards of achievement. "Achievement"

(18a) Ralf Dahrendorf, Class and Class Conflict in Industrial Society, Stanford University Press, 1967 edition, pp. 68, 69.

never officially signified that one was numbered among the elect of God, but it helped nevertheless. Poverty never officially suggested you were among the damned, but it helped even more so. By the turn of this century, to succeed in business was the ultimate in achievement.

The literature of achievement sold in millions. Helen Williams, The Conquest of Poverty actually posited that if you thought achieving-thoughts, wealth would naturally and assuredly follow. The Secret of Achievement, and other such gems by Orison Swett Marden, sold more than three million copies by 1923.(19) As far as values go, "achievement" became lord of all. "Study to show thyself approved", said the Good Book ... which in American-ese read, study (if necessary) to achieve to show thyself approved! And achieve we have!

Futurists, such as James Allen Dator, and economic prophets like John Kenneth Galbraith, tell us that by the year 2000, "achievement" will have un-done itself. In its place, the post-industrial cybernetic society will adhere to "adaptive" not "achieving" values. From this, claims Dator, "the morality of the adjusted-oriented, not the achievement-oriented person" will emerge. Galbraith similarly sees the very model of a perfect businessman being replaced by the "education and scientific estate (EASE)". EASE will mean that man will live, not by achievement alone, but by every form of adaptation that issues from the post-industrial state.(20)

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(19) Reinhard Bendix, Work and Authority in Industry: Ideologies of Management in the Course of Industrialization, New York: John Wiley and Sons, 1956, p.260.

(20) Lee James Allen Dator, "Valuelessness and Plastic Personality", The Futurist, Vol. I., No.4, August 1967, p.53 and John Kenneth Galbraith's latest book, The New-Industrial State , 1967.

Their projections about a post-achievement and pre-adaptation society make sense, generally. But not for the Negro ghetto. From every angle, achievement will be the watchword within ghetto communities. Even while the middle class plans to loosen its commitment to achievement, they will demand of the lower classes frenetic adherence to their falling value -- partly, no doubt, as a compensatory mechanism. The ghetto, itself, will eagerly pursue this value, as outward signs of achievement become more permissible and possible.

The danger lies not in ghetto failure, but in ghetto success. They may fulfill their "achievement" longings, only to find that by 1988 it no longer confirms the status and recognition they so dearly sought. In Calvin's Geneva and in Mao's Red China, reporting another's personal deviance to a superior evidences the "achieving person" par excellence -- not the tattletale it now seems to us. Will "achievement" by the Negro ghetto residents seem as absurd and out-of-place to the "adaptive" society of 1988?

The chances are that it will. If present-day interest in the ghetto schools emphasizes only educational and employment achievement patterns that may be obsolete in two decades, we will have built a cultural bridge to nowhere. Here Moynihan provides a timely warning. Make it possible for the Negro ghetto family to function and they will provide the bases for achievement. "After that, how this group of Americans chooses to run its affairs ... is none of the nation's business". (21) This is another way of saying, let the Negro ghetto family "achieve", and its members will "adapt".

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(21) Daniel P. Moynihan, The Negro Family: The Case for National Action, Office of Policy Planning, The United States Department of Labor, March 1965, pp. 47, 48.

(b) Change in priorities of acceptance: "Self-Help" and "Hope".

"God helps those who help themselves", as the saying goes. Like many such truisms, some truth is contained in them. The individual is thrust back on his inner self, where he receives divine sanction to help himself. Individual initiative, the power of the inner self, the self-acting man, no man is really lost unless he chooses ! There is some strenghth in that kind of saying. "Self-help" has its cultural place!

It also is a lie to much of social behavior in our national culture. All men need help in some ways. Not all resources come from within the individual. Our culture tends to assume a sense of shame about our general human need for help. True, sometimes help is more destructive than constructive. Sometimes it is poorly disguised interference.If the helper is saying, "I will help you if you consent to needing me", you have neurotic dependence -- neither help nor hope. But all that granted, it still is true that not all psychological and social resources come from within the individual. All men need help from outside. Even a genuine friend can only come from without.

The assumption that the mentally and socially ill could help themselves if they only tried, has perpetrated much romantic nonsense and even more social pathology. A mentally ill person needs outside help, primarily because his self-help efforts are self-defeating. The socially ill - the ghetto family -- needs outside help, primarily because the actions it takes on itself lead more and more to social pathology. Under some conditions, man is helpless. At such times, "self-help" increases the sickness; it does not help. In William F. Lynch's penetrating analysis of cultural hope, he makes clear that:

> "When I say man is helpless, I wish to convey that he is beyond the point of self-help, but is not beyond help".(22)

This middle-class value, positing that all the lower classes need are a few stimulants toward "self-help", has thus far only compounded the psychological and social problems of Negro ghetto living. Will this value continue to motivate much of national action during the next twenty years? The broad evidence suggests, "yes". Hopefully, however, it will be less dogmatically applied by future educational policy planners. But some cultural questions first require answering.

How many educational programs for the poor of 1988 will be posited on the belief that, here are the goodies -- the new technology, the better school buildings, the new teachers, etc. -- now you help yourself? How much educational policy for the 1988 poor will say, we, the middle class, shall give you help, as long as you acknowledge your continuing dependence on us? The ghettos do need "us". They do need help, but not on that basis. The real question is whether middle class educators will come to terms with the subcultural fact that the ghetto family, school, and employment structures are beyond the point of "self-help", but not beyond help? Will help be devised without shame and dependence, and therefore with "hope"? The answers are not yet in.

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(22) William F. Lynch, Images of Hope, Baltimore-Dublin, Helicon Press, Inc. 1965, p.76.

In the ghetto, there is much mental illness and even more social pathology. To the extent that "self-help" continues to dominate the middle class response to lower class needs, the ghetto problems of 1988 will be worse than they are today.

(c.) Change through value conflict.

Certain positively held values are always in conflict, at the cultural level of analysis. "Individualism" versus social "unity"; "freedom" versus "justice" -- these values never stop their warring. A society motivated solely by "individualism" lands in political anarchy. One dominated by consistent "unity" ends in rigid tyranny. When "freedom" reigns supreme, one man's rights equal another's injustices. In absolute terms, absolute freedom results in absolute chaos. On the other hand, where "justice" becomes lord of all, no freedom survives. Man gets his robot place in society, and, like the de-humanized machine he becomes, he functions -- but he does not live. Value conflict is culturally inevitable.

The sparks that fly from this kind of value friction, however, have much to do with the quality of living within a given national culture. Sparks are, themselves, signs of life. Where no sparks fly, there is no light.

Contrary to many assumptions, there is much life in the ghetto. Sociologists have pointed to what they sometimes call "value-stretch" among lower class persons in American society.(23) This describes the phenomenon in which lower class persons report one set of values when talking to middle class persons, and another set in community with members of their own class. Before social workers, police, and clergy, unwed mothers profess their sorrow and shame. With their own community associates, illegitimate pregnancy confirms high status and welcomed maturity -- with no shame.(24)

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(23) James Allen Dator, op. cit. See also Ralf Dagrendorf, Class and Class Conflict in Industrial Society, Stanford University Press, 1967 edition, pp. 70, 71.

What we have, here, are class norms, derived from basic cultural values, in conflict. The balance between "individualism" and "unity","freedom" and "justice", shifts markedly between classes. What the middle class perceives as "freedom" is felt as "injustice" among lower classes. How the middle class perceives social "unity", and its incumbent responsibilities, denies status and respect to lower class "individuals". Furthermore, within the lower class itself, a widening conflict exists between the youth and elders on the same issues. Similarly, middle class youth accept sexual purity and hard work when talking to middle class elders, while with their own age company, a new balance among conflicting values is emerging.

The projection is that the balance pursued by the youth within both classes will succeed by 1988. This implies a lessening of the future gap between the middle and lower classes, than presently exists in these specific areas of value conflict. (24a)

(d) The appearance of a new value or the death of an old value

Not much can be said for certain about the emergence of new cultural values within a particular society. Every culture, however, has latent values within its tradition, which could appear with fresh power. Ours is no exception.

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(24) Lee Rainwater, "Crucible of Identity: The Negro Lower Class Family", Daedalus - The Negro American, 2, Journal of the American Academy of Arts and Sciences, Winter 1966, pp. 185-187.

(24a) For further discussion of this point, see Section III D, pp. 99ff.

"Blessed are the poor", "the humble", and "the peacemakers", we still teach our young. However blessed these values are called, our acquisitive, powerful, and competitive society has yet to attribute economic, social, or moral rewards to the "poor"... to the "humble" .... or to anti-war adherents. Empirical studies have not at all determined the conditions by which latent values move to the fore. Social scientists know that throughout history they have, and likely will again. But the subject remains understudied and generally ignored.

Consequently, no projections are possible. But I have a hunch -- no more than that. When the middle class looks at the lower class ghetto "like it is", they will bring from it new life for the values of relative "poverty" ... "humility" ... and "peace-making". Much in 1988 may depend on that revaluation.

3. Symbol Change

Symbols are cultural objects of empirical reference which point to something beyond themselves that is non-empirical. The Star of David, Bethlehem Star, or Red Star assume forms that are visible and touchable, but point to a non-empirical system of beliefs, values, and norms. In this sense, symbols provide bridges between the empirical and non-empirical worlds. This is, in fact, the root meaning of symbol, coming from the Greek συμβαλον = συν βαλλω , i.e. to throw together. Symbols throw together the specific and abstract worlds in which man lives.

Symbols may change, die, or be born, irrespective of the validity of that to which they point. Feet, for example, were once the dominant sexual symbol in the early stages of our cultural history. In our age, sexual symbols have moved up the leg... but interestingly, it is changing again. Bare feet are, symbolically, coming back in style. The "Kingdom of God", for another example, is a symbol to which adherents of the Judeo-Christian religions point with conviction, even though that symbol is dying. "Kingdoms"and "crowns" no longer are the existing political realities with which contemporary man identifies power and community. And the "democracy" or "communism of God" makes no cultural sense, since it possesses no historical continuity.

Negro ghetto life is filled with new and metamorphosized symbols. All kinds are there - corporal symbols, natural symbols, temporal, spatial, numerical, color, verbal, auditory -- to mention just some types. In a real sense, the ghetto lives by its symbols, since these are among the few possessions it owns. Sadly, social scientists neglect this rich source of information. The profession might rethink its prejudice, especially if Carl G. Jung was anywhere near right when he observed,(25)

> "I ... regard the symbol as the announcement of something unknown..."

In this sense, a symbol announces the future.

A quick look at the ghetto symbol of Good and Evil may tell us something of the future ... even in the absence of much-needed empirical studies on the subject. The Powers of Light and The Powers of Darkness go deep into the center of Western culture. And nowhere are these color symbolisms more complex than in the Negro ghetto. The once-powerful Satan served the social function of inciting and motivating people to do battle against the big and little evils of the day. But the Devil has been laughed out of court. Today, demons are cute, devilish, funny pranksters in red tights, or college football mascots, or labels for canned ham. The demonic symbol of cosmic Evil is dead. "Blackness", and its power, however, are very much alive.

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(25) Carl G. Jung, Modern Man in Search of a Soul, New York: Harcourt, Brace, and Co. n.d., p.25. See also C.G. Jung, Symbols of Transformation, The Collected Works, Bollingen Series XV., Vol.5, New York:Pantheon Books, 1952.

"Blackness" according to any thesaurus, adds up to everything bad, and "whiteness" everything good. In our society, this is true for the cultures of both the black and white races. Psychologically, aesthetically, and biologically, there is no such thing as a pure white or pure black race. Color variations within any one body, as well as between bodies, are far too rich and varied for that. Culturally and socially, however, that slight variation in pigmentation solidifies into two steel-plated armours of "black" and "white". The battle lines are drawn on these color symbols.

The struggle to come to terms with "blackness" consumes much psychic energy in the ghettos. A few weeks ago in Washington, D. C. one of the most well-known Negro leaders in the country stood before a predominantly Negro audience and made this slip in answer to a question from the floor about his own achievement. He began, "When I was a Negro..." The audience allowed him to go no further. This particular Negro had been considered militant by 1967 standards. With that one slip, however, he undid his political future among "black" people -- be revealing the depth of his unconscious acceptance of white man's negative connotations of "black". Even this exceptional Negro leader had been carefully taught to despise and reject himself -- as "black".

In this context, the "Black Power" movement constitutes an attempted symbol metamorphosis of immense significance. Culturally, black is to become white, and white black. Evil becomes the "white establishment", the white devil. Good -- the "black establishment", the Black Power! Many analysts assume that the white middle class fears the "power" side of this metamorphosis most. I doubt it. Changes in "blackness" and "whiteness" touch very deep and sensitive cultural roots. Any metamorphosis, particularly one with broad social reality, elicits fear, awe, and uncertainty.

The question is, will "Black Power" succeed during the next twenty years? The answer is "no"--not as a symbol. Culturally, the change offers no historical continuity. Socially, the ghetto problem is first of all a class phenomenon, in which color complicates but does not originate it.The success that the symbolic "Black Power"movement achieves will be to call attention to the need to expand our color symbol associations -- and in this area the curriculum planners will be decisive. But as a cosmic symbol of Good and Evil, color will not live nearly as long as the devil did. Neither the white nor black establishments really possess that much power. The Black Power movement attributes more strength to White Power than it either deserves or can handle. It is, in fact, a compliment to "whiteness" that cannot last.

During the next twenty years, our demons will be neither black nor white. The cosmic Devil who can incite man to righteous battle has become essentially nameless, bodyless, and formless. Cosmic evil in 1988 will, therefore, be more closely connected with the symbols of namelessness, bodylessness, and formlessness.

4. Change in Belief - Basic Life Meaning.

Changes in belief do not interest the social scientist from the viewpoint of religious content. That concern legitimately belongs to the theologian. Sociologists, in particular, view the cultural component of beliefs as the basic ways people see their world. How we look at and organize life meanings, our Weltanschauung, our world view, the purpose of existence -- in their essential cultural forms!

Talcott Parsons and Robert Bellah of Harvard University use the following matrix as a beginning. It seeks to analyze how a man's basic beliefs express his relationship to the world in which he lives. Does he see himself in terms of his "quality" or "performance" as a man? Do his beliefs confirm "particular" or "universal" validity to his existence? For the immediate purposes, where does the Negro ghetto man place himself in the world?

	Quality	Peformance (achievement)
Universalism	(Black Muslim)	(Black Power)
Particularism	?	(Past Beliefs)

In the past, the Negro ghetto man believed by "performance" alone, he could be personally and "particularly" at home in the world. No quality of his "blackness" possessed "universal" validity, no matter how successful the performance or how particular the achievement. The Black Muslim movement, today, maintains that blackness itself confirms universal validity to all black men, on the basis of his inner quality of "blackness". Performance means little. Black Power, on the other hand, combines the universal nature of "blackness" with performance through power.

Beyond these general outlines, we know little of the basic beliefs of Negro ghetto residents. Nor do we know how educational policy in the ghetto schools conforms or clashes with these basic forms of belief. If education emphasizes "performance" to a sub-cultural group, for whom only the "universal quality" of blackness means anything, what success can it have? And what of that "qualitative" condition of man,which education loves to bring to each individual person in all its "particularity"? What could make such a policy believable to a ghetto student? Much guidance to educational policy planners lies in analyses of basic changes in cultural beliefs of the ghetto. Currently, lack of knowledge makes all projections in this area impossible. Research is required to learn how to relate the cultural forms of belief to the educational forms of instruction.

5. Changes in Cognitive Factors

One of the functions of every culture is to provide its members with basic cultural ideas. All men require the minimum accepted knowledge, about the physical and social world, knowledge of how to live in that world, and ideas about our own social organization. The family and education institutions traditionally disseminate such cultural ideas.

The ideas imported include elementary knowledge of cause and effect, subject-object relationships, as well as the basic structures of language, thought, moral judgement, numbers, games, time, space, the earth, and many more. A "scientific" model of knowledge is essentially what our culture requires of all its members in its simplest forms.(26)

In many societies within Western culture, the lowest classes are the least "scientific" and most "magical" in their **ideational orientations.** To some extent this is comparatively true for Negro ghetto residents in America. But ideational differences between classes in our society are relatively insignificant due to the additional socializing agent of television. Since, by the time the average American child is 15, he spends 3000 more hours before a television screen than in a classroom (and undoubtedly more for lower classes), the capacity of television to universalize basic cultural ideas should come as no surprise.(27) This trend is currently irreversible, and certainly can not change by 1988.

Ideologies and technologies constitute particular forms of cultural ideas. Ideologies comprise the rational formulation of ideas and beliefs; technology -- the rational formulation of ideas and materials. Ideologies in the Negro American ghetto will bloom and wither, in the rapid succession typical of lower classes everywhere. Communism will be one such ideology, appealing to small and flickering numbers of Negroes. Communist iedeology simply has no future among the vast majority of ghetto Negroes, because they seek full admission into an essentially conservative, not radical, society.

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(26) See particularly the collected works of Jean Piaget and his Swiss colleagues on the psycho-cultural development of children.

(27) Reported by Gabriel Ofiesh, Staff Meeting, National Planning Association, July 21, 1967.

Technologies are essentially norms for using tools -- technical norms, combining cultural ideas and material. Technological innovations will assuredly continue to increase, as will the educational experts who understand them. For the less technically oriented social scientists, like me, only this much is sure. Technological innovation will not spread evenly among the classes and communities of our society. As in so many instances, the poor will be last, and the last, poor.

There are two possibilities for improving the technological lot of the poor. First, at some point in the future, the quantitative nature of technological inventions will introduce qualitative changes in the educational system. Second, at some point in the future, man will learn much more about the social conditions that are necessary before inventions can be meaningfully used. If anyone doubts the seriousness of the latter problem, take a look at the thousands of dollars of American tractors gathering dust and rust in rural Southeast Asia. Or take a look at the modern, French-built hospital in Laos -- empty and abandoned. Dumping a shiny new invention on a people presupposes a cultural, class, and community readiness to use, maintain, and benefit by it. It may take at least another twenty years for this old lesson to sink into our collective decision-making processes.(27a)

(27a) The role of technology in general, and educational technology in particular, for ghetto education is discussed more fully in Section III E, pp. 101 - 113.

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The five dimensions of the cultural subsystem have been discussed on one issue each. Obviously, possibilities for analysis extend far beyond these single selections. The hope was as much illustrative as analytical -- to demonstrate the significance of culture in the determination of educational policy and priority analysis.

The cultural subsystem remains the least studied and most underrated in the social system, even though its relation to social values social goals, and policy formation is crucial. The 1988 future of cultural analysis will undoubtedly improve its contributions to the education of the Negro American urban poor.

C. Changes in the Social Subsystem

C. Changes in the Social Subsystem

Four dimensions of change in the social subsystem will be projected. The focus for each remains on those factors which affect the educational development of the Negro American urban poor. The four dimensions are: (1) change in social values, (2) institutional changes, (3) changes in the distribution of possesssions and rewards, and (4) changes in personnel recruitment.

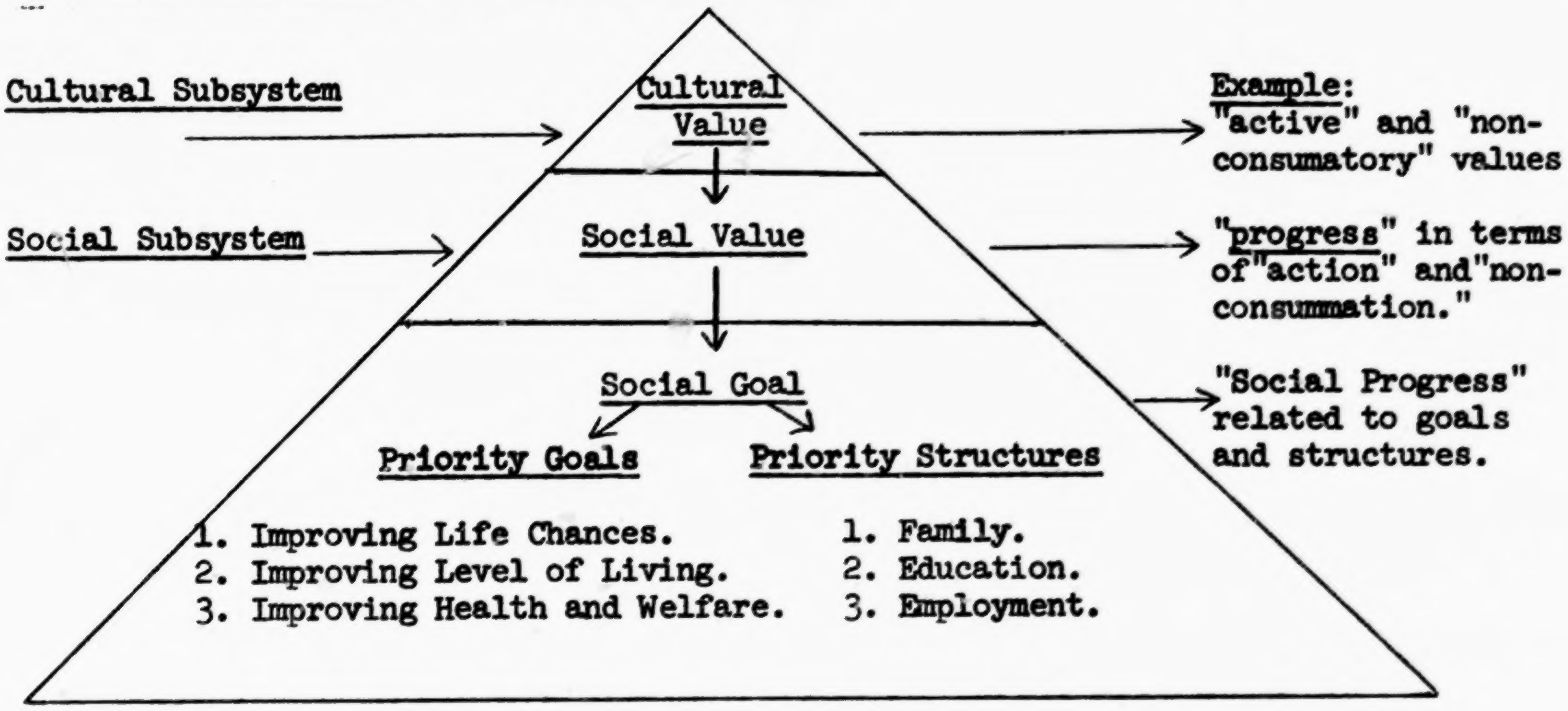
1. Change in Social Values:

Social values are those which directly affect social roles and social interaction. Their scope is more prescribed than a cultural value, which is understood as a conception or standard in relation to which all things are compared and considered meaningful within a specific culture. Social values derive from cultural values. This implies that the social value in question affects more specific norms than those at the cultural level of analysis. The specific norms which social values affect, in turn, relate directly to social goals. At this point, the skeleton of policy research takes on very alive social flesh.

First, before the flesh, a few more conceptual tools for perceiving! In earlier discussions of social goals, and their relation to social values (Section II A and II B), three social goals were related to three social structures on a priority basis. They are, with specific reference to Negro ghetto education:

1. Improving Life Chances ——————→ 1. Family Structure.
2. Improving the Level of Living ———→ 2. Educational Structure.
3. Improving Health and Welfare ———→ 3. Employment Structures.

In schematic form, this pyramid of relationships is ready to be re-animated and tucked in the back of the mind.


Cultural Subsystem
Cultural Value
Example:
"active" and "non-consumatory" values
Social Subsystem
Social Value
"progress" in terms of "action" and "non-consummation."
Social Goal
"Social Progress" related to goals and structures.
Priority Goals
Priority Structures
1. Improving Life Chances.
2. Improving Level of Living.
3. Improving Health and Welfare.
1. Family.
2. Education.
3. Employment.

The specific social value which will be analyzed here is "progress." The concept, "progress," derives from the interaction of at least two cultural values: "action" and "non-consummation." We are an "action-oriented" culture, not passive or contemplative. Also, we are a "non-consummatory," an "always-something-more-to-do" culture. Not one, like the Middle Ages, which believed that various stages of natural law should, could, and were to be maintained as is!

In our society, "progress" is therefore a particular kind of progress. For us, it means progress in the direction of cultural "action" with "always-expanding-possibilities." Not "progress" in the direction of "passive contemplation," by maintaining a "natural" and assumed status quo! The latter idea of progress, which is one of many legitimate possibilities, makes sense only in another dominant culture than our own. In our culture and in our particular society, social "progress" means "action" of a "non-consummatory" kind. This particular meaning will hold until 1988 and far beyond.

Within the above scheme, the future of Negro ghetto education will be examined on the basis of "progress" toward meeting social goals. First, a question about progress and structural reform.

The schools in the lower class Negro ghettos are inferior in every respect to middle class white suburban schools. Family disorganization in the ghetto more pervasive and employment opportunities more illusory than anywhere else in American society. These conclusions march out from every report, study, and newspaper with an almost daily cadence. The repetitious pounding of this judgment forces the question about the ghetto social structures of the family, education and employment. Are these structures capable of reform?

If you go into the ghetto, the answer is a resounding, "No." A community neighborhood house, with more than twenty years working experience in the ghetto, concludes, "The last twenty years have only made the problems worse, not better." A ghetto teacher, formally recognized by the city as superb, says, "The school is beyond reform; the only thing to do is blow the system up and start again." A ghetto counselor decided, "All I can do is put a band-aid on a cancerous patient. Major surgery is the only answer, if the patient isn't already dying." Concludes a ghetto leader, "The structures are interested in nothing but maintaining themselves; they cannot change now." The graduate from a ghetto high school asks, "My diploma means nothing-- why? I'll always be in the ghetto." And a dropout observes, "The system just ran over me; there is no hope, there." In the ghetto, no one believes the existing social structures are any longer capable of self-help and most, not even of outside help. The only hope one hears in the ghetto is for para-educational and para-employment structures -- those which work "along side" existing structures, but are not consumed by them. Only these can "care," says the ghetto resident. Only these can get beyond "institutional self-perpetuation." (28)

If one goes outside the ghetto, the answer is a resounding, "Yes." A whole army of new ideas is ready to march into the ghetto from without -- new technologies, new school parks, newly trained teachers, new teaching and curriculum policies, schools as social service centers, employment-related educational goals, plus whole libraries full of ideational troops. They readily and eagerly await the political command -- and into the ghetto they will march. For this growing group of experts, the social structures of the ghetto-- employment, education, and even the family -- are going to change, however sorry their present lot. Ghetto structures can help themselves and will be helped. The invading army of ideas may follow a zigzag route, but progress, they aver, will result.

One thing is certain for the next twenty years. Change will come to the ghetto. But will change bring progress? And will progress relate to basic social goals, affecting family, educational, and employment structures? However spoil-sport it sounds, it is necessary to remember that twenty years ago whole armies of housing-redevelopment ideas began marching into the ghettos. Changes followed. Progress, for some, came. But social goals are not fulfilled. The confident predictions of slum eradication of yesteryear did not materialize. The slums have not gone away. Today they are larger and structurally worse. Will the new batch of 1968 ideas meet with any more progress in 1988 than those of 1948?

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(28) Interviews with ghetto leaders and residents during August, 1967, by David N. Ruth. Individual names on file.

The answer to that question depends upon the social priorities we choose and choose to act upon. Projections of change are certain. Projections of change toward progress, just as sure. But projections of progress in meeting social goals? The 1988 answer to that one will, in fact, be decided within the next few years.

The successful decision will come from a sustained and fresh look at the relation of social values to the basic structures and functions of the ghetto family, education, and employment. Such freshness, to begin with, requires minds that are neither de-historicalized, de-socialized, nor de-localized. Those which look at the ghetto, in the ghetto, and by the ghetto -- like it is!

2. Institutional Changes:

Social institutions change on the basis of their structure and function. In every society, values affecting social institutions precipitate structural changes pertaining to their (1) nature of obligations, (2) the expression of feeling, (3) the basis of commitment, and (4) the basis of rewards. Sociologists have created many conceptual tools to help elicit such information (e.g., the brief list on Table I), and are always busy polishing up their beloved handiwork. In every society, also, clusters of values are ranked according to the importance of their function to the whole society. With these generalizations safely out in the open, the analysis will shift to some structural and functional comments about the future of four institutions: the family, education, employment, and the government.

(a) The Family:

It will come as no surprise to most people that the family is here to stay. Some, though hard to believe, do not yet know this. Last week, I heard a well-intentioned white "liberal" lady advance her solution to ghetto family disorganization. "What we need," she gushed, "is to take all the Negro children out of their families -- such as they are, put them in a nice institution, and love them." Fortunately, such disruptive nonsense will not survive.

The Negro ghetto family is in serious trouble. It is structurally imbalanced and functionally unable to prepare its members to participate in and enjoy most of the social values to which it adheres. But somehow, all the long lists of statistics, amply documenting the structural and functional disorganization of the Negro American ghetto family, fail to make clear to the majority of Americans the immense psychological and social costs of ghetto family life.

The white (and Negro) middle class wonders why the ghetto family behaves the way it does. Its male-female patterns of going together, becoming pregnant, getting married, husband-wife relationships, marital breakups, the house of mothers, boy friends not husbands or fathers, its destructive tendencies to tear each other down, its early abandoning their children to gang life on the street, the violence, contempt, indifference, despair -- and yet somehow surviving in the midst of it all -- baffle, but do not bring understanding. White families wonder why black families behave so strangely, merely because white men have locked up black men in a social cage.

There is a Kafka-esque parable by Rollo May about the man who was put in the cage, which tells us where it all ends.(29) A king, in another land, of course, wondered one day what would happen to an average man with an average wife and children if he were put in a cage. So the king caused a cage to be brought from the zoo, hired a psychologist to observe, and put the average man in the cage. At first, the man was simply bewildered and said to the psychologist, "I have to catch the tram; I have to go to work; look what time it is, I'll be late for dinner. Later, the average man began to realize what was up, and he protested indignantly. Weeks and weeks of vehement protest followed. Then the psychologist asked him, "Why are you protesting? I give you plenty to eat, a good bed, all the information you need, and you don't have to work. Why protest?" Then the man no longer protested. He was silent. And all the psychologist saw was deep hate glowing from his deep eyes.

Soon, another change occured to the man in the cage. He desperately tried to placate and agree with the king and the psychologist who looked him up. He even vowed that he himself chose to be in a cage. He deserved and even loved his confinement. Then, he became sullen and morose. He no longer said anything but "It is fate." Then, just, "It is." The man in the cage no longer said "I." He had accepted the cage. "He had no anger, no hate, no rationalization. But he was now insane." In his final report, the psychologist noted, "They say that nothing is ever lost, that matter is merely changed to energy and back again. But he couldn't help feeling something had been lost, something had been taken out of the universe in this experiment, and there was left only a void."

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(29) Rollo May, Man For Himself, New York: W. W. Norton and Co., 1953, pp. 145-148.

The ghetto family in its black social cage experiences every one of these social patterns -- disruption, bewilderment, protest, hate, placation, self-resignation, loss of identity, and pathology. If, like the psychologist, the white middle class of the future gives the Negro ghetto family merely enough food, a decent bed, sufficient information, and money for its needs -- and no more than that -- the social pathology of the ghetto family will further deteriorate by 1988. And the loss will be great.

Our society really does "know" what needs to be done. It is no sociological secret. The first answer to the black social cage is to unlock it. Second, the caged family needs help. The Negro family's long history of "450....years of victimization"(30) requires massive social and economic help , before the caged family is able to rebuild its own structures, and function on its own terms, in a non-caged world. Until that decision is made, and at that level of value commitment, the ghetto family will stay, in the future as in the past, in the black social cage that white man built. Until middle class values, goals, and priorities change, not all the king's money nor all the king's men will put the ghetto family together again.

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(30) Lee Rainwater, "Crucible of Identity -- The Negro Lower Class Family," loc. cit., p. 173 (see pp. 172-216).

(b) Education:

Unlike the family projection, educational institutions in the ghetto will undergo extensive structural and functional changes during the next two decades. Educational experts throughout the country have already published impressive evidence of the ranges of change in store. On the whole, they will succeed. Reports, like the Passow study for Washington, D. C., will be put into effect throughout the country by 1988 -- and with interesting variations among our cities.(30a)

The most significant structural change for educational institutions will be increased de-centralization and localization in school organization and decision-making. This will be accompanied by an increase in national planning, even while structural power moves down into state and local communities. Functionally, education can be expected to take on many "pattern-maintenance" and "adaptive" functions, which sociologists usually find among family and economic instituions. Schools will gradually increase their social service functions in the areas of health and welfare, while building job-oriented goals into educational curricula. When industry and labor (in that order) receive a form of Federal subsidization, they will assume some responsibilities, in conjunction with the schools, for the training of prospective employees. Success in this area will be impressive but limited.

Attempts at racial integration in the cities is one educational function which will be abandoned as impractical within five years. Most urban schools, by that time, will have become essentially re-segregated with Negro students... while in other city centers, that trend will be clearly discernable. Not until the ghetto family is unlocked from its

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(30a) A. Harry Passow, Study of the Washington D.C. Schools, Columbia Teachers College Press, September, 1967.

social cage, and allowed to move freely and naturally through the society, will this pattern change. In the meantime, the creation of "school parks" enrolling 10,000 to 20,000 students will assume some integrative significance during the second of two projected decades. But urban racial integration, as a school policy and social function, will fail.

(c) Employment:

Institutions of employment will be invited by educators to join in the development of job-oriented goals and training programs for ghetto schools. Business and labor, including various craft and trade unions, will however, accept that invitation only under one of two conditions. One, when sufficient political leadership and muscle are present, independent action by business, labor, and various community leaders will combine to initiate joint programs focusing on particular ghettos. This is essentially the Bedford-Stuyvesant approach which New York Senators Robert F. Kennedy and Jacob Javits have inspired. Second, when the Federal Government agrees to subsidize business and labor for establishing training programs in conjunction with the school system, the employing institutions will respond.

Those situations, in which business and labor act on private initiative primarily, will serve eventually as demonstration projects. By themselves, they will not extend sufficiently in kind or place to contribute significantly to overcoming unemployment problems in the ghetto. In those selective places where such programs do operate, their success will offer models of educational-employment-community interaction.

The major directions of employment institutions in ghetto schools will come in response to Federal Government subsidies. In this sense, employment institutions will change their profit orientations neither in structural nor in functional terms. When, and only when, training programs in the ghetto schools become profitable, will business and labor modify their functions enough to make a contribution to ghetto employment. In any case, the profit motive will dominate the social functions of business and labor as much in 1988 as it does today.

Educational subsidies to business and labor by the Federal Government will come within the next ten years, but not easily. Intense political repercussions can be expected to accompany such political decisions. The fact that our Federal Government does already subsidize big business machinery, and gives millionaires a 27½ percent oil depletion allowance, plus the fact that much bureaucracy amounts to no more than a form of middle class subsidy, will not warm the collective will of Congress to help the rich help the poor.(30b) Congress will eventually act when it runs out of other alternatives...which won't be too far from 1970.

(d) Government

Sociologists do not generally agree among themselves on overly much. But on the function of government, they do agree. Sociologists see government's primary function as "goal attainment." The government sets national goals, establishes priorites among national goals, and, through its policy and budgeting mechanisms, attempts to see that our national goals are attained. This "goal attainment" function of government

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(30b) See especially the remarks of Charles E. Goodell, in New Generation, Summer 1967, pp. 8, 9: "It seems anachronous that employers have a seven per cent tax credit available for the expense of machines or physical facilities, but have no tax inducement to help human beings." Also in this issue, the discussion of Kenneth Marshall, "The affluent people in our society are subsidized in many ways..." (p.24).

holds true for economic, political, military, etc. goals, as well as for the broad social goals of the nation. Successful education, including ghetto education, constitutes one of the major social goals which government seeks to attain.

The structure of government is a bureaucratic one. The nature of this bureaucratic beast has fascinated minds for many years. From the early Greeks, through Max Weber, to men of the future, the subject has and will continue, to inspire reams of inquiry. For bureaucracy, the contemporary social goal of improving ghetto education during the next two decades raises an immensely difficult problem. The direct question is, will the bureaucratic structure of government allow government to perform its goal-attainment functions?

If Inventing the Future supplies the answer, government bureaucracy will soon become a structural exhibit in an institutional museum.(31) The perspicacious author of this book sees contemporary government bureaucracy as General Cavaignac saw restive unemployed workers in 1848, after the Paris revolution. To preserve social order, the General had one gang of workers dig a ditch one day, and another gang to fill it up the next...etc., etc., etc. Gabor concludes:

> "In one of its modern forms, it is known as Parkinson's law, the proliferation of bureaucracy, where anybody at a desk can always give work to somebody at another desk whether the paper work covers productive work or not...Of course, these people would indignantly deny that what they are most doing is keeping thousands of tons of paper in unnecessary circulation among themselves. They have a good conscience working so hard at their telephones and typewriters or rushing

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(31) Dennis Gabor, Inventing the Future, New York: Alfred A. Knopf, 1964.

> from one place to the other for urgent conferences. This is a wonderful thing in this modern system of waste -- it makes people believe that they are useful."(32)

Gabor genuinely admires bureaucracy's function of keeping the social organism psychologically occupied. But he does not believe it can much longer attain any other social goals. It has become, for him, the "Parkinson blister" -- a temporary social sore that will soon disappear.(33)

Gabor might be right. A future which man deliberately invents may not need a bureaucratically subsidized middle class -- after the work ethic itself is no longer an ideological hangover. Already, one hears echoes in the ghetto supporting Gabor's view. Many, there, have given up believing in the ability of government bureaucracy to attain, in more than paper reality, the proclaimed social goals. So the ghetto turns its hope in the direction of para-educational and para-governmental structures. Maybe these will function, for real, they hope.

But bureaucracy need not be yawned out yet. The inventiveness of that creature is impossible to over-rate, especially if it actually is a matter of survival. After having come out of three recent years within the Federal bureaucracy, I agree with Gabor that too much paper is frightening too many people. I also agree that ideas have little or no chance to move up from lower structural levels. Bureaucratic ideas only flow down, where anxiously awaiting employees, like the Greek choruses long ago, take the tune and sing it to death. Within bureaucracy, however, are some very keen individuals. In groups, not so! Individually, yes! And occasionally, these individuals even help bureaucracy overcome itself.

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(32) Ibid., pp. 119, 120.

(33) Ibid., p. 132.

Bureaucracy has evolved the pattern of consultants and developed intimate affiliations with academia and private research centers. It has even created within itself structural pockets of action. In this way, top-ranked bureaucrats are able to give and receive fresh sources of ideas, even though, if similar ideas existed within middle and lower levels of bureaucracy, the top group would never learn of it. The point is that bureaucracy has not yet smothered itself in its own sawdust. True, you cannot punch a sawdust bag and make much headway. You can, in fact, be buried if you poke too hard. But even so, individual bureaucrats occasionally open a slit in that sawdust bag -- and the fresh air revives.

This kind of bureaucratic achievement, while sometimes abused, is not to be denigrated. It is real. Fresh air from whatever direction is still fresh air. The most amazing social miracle of all is that, eventually government bureaucracy does work. It alone has the structural resources to operate on a national scale. It alone has the functional responsibility to enunciate and propogate national goals. It alone has the planning, programming, and budgeting facility to attain those goals. It alone has the financial capacity to make possible the serious study of priority and policy research. Bureaucracy alone does not have the anwers to ghetto education. But when it wills, it can find that answer.

3. Changes in the Distribution and Possession of Rewards

No issue is more pertinent to poverty or more sensitive to society than changes in the distribution of possessions and rewards. Poverty, by its existence, implies an unequal distribution in economic possessions and social rewards. Poverty becomes a social problem when enough social groups believe that the distribution is not only unequal, it is also unjust. When anyone relates injustice to a redistribution of economic possessions and social rewards, society becomes sensitive.

No society likes the face of poverty. Even to admit that it exists tells everyone what we all fear. That we are an unequal and unjust people! Poverty makes us aware that we all are, at least in part, a bit phony and pretentious after all. It stings us with the thought that we are not as righteous as we'd like to believe we are. Poverty exposes us, and we wish it would go away.

Some of us never admit that poverty exists. For these people, denying the existence of a problem is the only solution. Theirs may be neither an economic nor social loss; but it is a human loss. Others admit it tentatively into view, and say -- do something but don't make your remedy worse than the problem. That often means, do anything you wish, but don't redistribute my money to the poor. Fortunately, and in a particular sense it is fortunate, poverty does not go away. I hate to say it, but once in a while a truism just happens to be true -- "The poor you have with you always."

Poverty does not go away, because it is a relative concept. It relates to the way society distributes its economic possessions and social rewards. So long as we are an unequal and unjust people, we will distribute possessions and rewards unequally and unjustly. Admittedly, the old saying can be, and far too often is, used as an excuse to avoid facing our economic and social injustices -- as well as our own human nature. About that excuse, we dare be contemptuous. In that sense, the truism is a lie. But our cultural saying comes back to haunt us nevertheless. Even if not "always", why *are* the poor with us? It is, *with us*, that they are.

The distribution of economic possessions and social rewards is relative to time and place -- as is poverty also. For unknown reasons, at all times and places, humans seem to live in some kind of cave. A stone cave for the cave man, and on through history to the tent cave, the wood cave, the steel cave, the reinforced-cement cave, and to the floating space caves of the future. It is still a cave. And some caves are bigger and better than others in every age. Place, too, is relative. An igloo cave at the earth's poles or a grass cave at the earth's equator! It is still a a cave. And some caves are bigger and better than others in every place. Poverty reminds us, socially, that we do not really wish to be classless -- as long as we are not in the lowest class. Poverty reminds us, individually, that we do not really wish to be equal -- as long as we are not the least among unequals. Poverty forces us to look at our world and ourselves, "like it is!" We are embarrassed!

The idea of redistributing our economic possessions and social rewards yanks us back to our three dearly-be-hated strategic variables -- culture, class, and community.

(1) *Culturally*, why *are* the poor with us?

(2) Why *have* we among us a lowest *class*?

(3) Why *do* the poor live in *communities*?

How strange to meet in the ghetto that old philosophic triumvirate of Being, Having, and Doing!

Since we have the poor with us in 1968, will the poor be with us in 1988? What do we will? If always with us, why?

4. Changes in Personnel Recruitment:

One of the biggest contributions to improving ghetto education will come from changes in personnel recruitments by employment institutions. Particularly significant will be changes in the source of recruitment and changes in the rules for recruitment.

(a) Source of Recruitment

Employment institutions will shortly move into the ghetto for a new source of recruitment. That, in itself, is a significant change. More so are the kinds of problems employing agencies and organizations will find there and solve.

In the ghetto are two kinds of employable youth: (1) those young people with high aspirations who have no idea how to get there, and (2) other young people who look for immediate benefits only. The ghetto educational system fails them on both counts. It provides them with neither the mechanisms to move toward their youthful and high aspirations, nor curriculum which is geared to producing immediate and visible results. This educational failure persists despite the long history of evidence indicating that lower classes have predominately "present", not "future", oriented values.

When employment institutions join educational ones in the ghetto, it will be possible for broad and constant cooperation in the planning of job-related curriculum goals. The experience of the Urban League suggests that "when low-income people have a definite goal at the end of the educational process, their motivation and achievement rise". But, warns David Rusk, "you'll never do this in education without specific jobs to plan towards." (34) This kind of employment -education joint curriculum planning will open many new sources of employment for ghetto youth and for employing institutions.

(b) Rules for Recruitment

The rules for the recuitment of personnel will also require change -- and will change with the growing education-employment interaction. Said one teenage unemployed dropout..."I should be able to flunk out of a job, not out of a piece of paper."(35) What this ghetto youth said should give him an A, plus a job-career, in any society. In more professional but less accurate language, he is saying the rules for recruitment should not ossify in personnel registers and minds. They should, rather, relate to actual working on the job. He wants rules related to capacity to perform. Present rules for recruitment often exclude ghetto youth from employment before they have a chance to perform. And ghetto schools seldom teach a youth how to fill out an application form, which they too seldom get beyond. For ghetto youth, paper rules have become paper bullies. The bully needs to be tamed by the real world. It needs to be punched in its paper rules.

The growing relationship between education and employment institutions will produce significant modifications within the educational ghetto curriculum and within those institutions that make the rules. Hopefully, this will deeply involve government bureaucracy itself. The dropout wants the changes to come now. Changes are already too late for many. But in this area of the social system, the future will confidently improve the welfare of more employable ghetto youth.

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(34) David Rusk, Deputy Director, Washington Urban League, Washington, D.C. in interview with David N. Ruth, August 11, 1967.

(35) Melvin Green, Washington, D.C., in interview with David N. Ruth, August 17, 1967.

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Wherever one looks in the social sub-system, three dimensions emerge -- as they did in the cultural subsystem. First, the prevailing importance of values throughout all aspects of ghetto problems. Second, the consistent relationship of social values to the priority social structures of the family, the school, and employment -- with the big plus of government. Third, the ever-present nature of our three demon variables of culture, class, and community. Each of these three dimensions has much to do with the summation of one teenage ghetto dropout. Melvin Green concluded his evaluation of ghetto education with this:(36)

> "You know, a lack of understanding will kill a whole situation."

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(36) Melvin Green, Washington, D. C., in interview with David N. Ruth August 17, 1967.

D. Changes in the Psychological Subsystem

D. Changes in the Psychological Subsystem

Education's primary interest in the psychological subsystem is socialization. For ghetto education, in particular, socialization for employability constitutes the current focus.

As a concept, socialization refers to that kind of learning which enables the learner to perform social roles. In our society, the family and educational institutions remain -- and will continue to remain --(37) the chief agents of socialization. A major criterion for determining the success of the socialization process in America is the employability of the subject. Successful fulfillment of social roles continues to mean, in large measure, the capacity of individuals to secure and maintain productive employment.

Five aspects of change will be examined from the viewpoint of socialization for employability: (1) change in the self's relation to society, (2) change in the self's relation to other selves, (3) change in the self's relation to other social objects, (4) change in the self's concept of self, and (5) change in objective aspects of the self. The starting point in each instance is the Negro ghetto resident.

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37. Current opinions about the relative increase in the socializing functions of educational institutions, with a corresponding decrease in family functions, are not supported by historical evidence. In modern societies, such as in the Soviet Union, where education extends to earlier developmental stages of the child, the family has become more influential, not less, in the socializing processes. As education increases the quantity of its socializing functions, the family's qualitative significance expands even more. See Talcott Parsons, Social Structure and Personality, London: The Free Press, 1965; Hans Gerth and C. Wright Mills, Character and Social Structure: The Psychology of Social Institutions, New York: Harcourt, Brace, and World, Harbinger edition, 1964; and Talcott Parsons and Robert F. Bales, Family, Socialization and Interaction Process, Glencoe, Illinois: The Free Press, 1955.

1. Change in the Self's Relation to Society:

Manhood and womanhood contain both biological and sociological concepts. Sex is given; one is either male or female and nothing else. Manhood and womanhood, however, are not merely given; they are also learned. A male learns how to be a man, and a female learns how to be a woman, by the people in his life -- by people within a specific society comprising a specific culture, class and community ethic.

a. The Male Relation to Society:

The Negro male, raised in the ghetto, learns that he has two social proofs of his manhood: productive employment and physical violence. When H. Rap Brown says before the nation's television cameras that "violence is as American as apple pie," he is absolutely right. On any given evening, one can witness, right on one's own living room T.V. screen, at least a dozen murders and twice as many brawls. Should the T.V. tubes happen to blow out, a brief look at the newspaper headlines will reveal man's uncanny preoccupation with all forms of violence -- from wars, to riots, to suicide.

Violence has symbolized manhood in our traditional frontier society since its inception. The difference between the Negro ghetto resident today and his middle class fellow citizen, has everything to do with employment. The white (and Negro) middle class males, who act out their manhood by being productive employees, can experience violence through the catharsis of myth and legend in literature or the screen. An unemployable male, particularly an employable Negro male who has been socially taught that he is less than man to begin with, also needs some way to act out his manhood. When employment possibilities escape him, violence does not.

Most male violence in the ghettos has, in the past, been directed toward himself, his family, and his own community. What made ghetto violence noticeable in 1967 was not the much proclaimed increase, but the change in direction. The Negro male has threatened to act out his manhood, not only on himself and his "own", but on the white society around him. The summer flames of Newark and Detroit still burned within the black ghetto itself, but they threw light on the white world next door. And the white man saw it. Whatever the power realities, black violence on the white world became believable to the Negro ghetto males last summer. They began to act, and therefore feel, like men.

This new direction of violence constitutes a major change in the self's relation to society, on the part of the Negro ghetto male. The power of local police, national guards, and Federal forces is such that male ghetto violence cannot possibly burn down the nation. (What ghetto violence does to our international integrity is another matter.) That domestic boast -- heard frequently throughout today's ghetto -- is essentially nonsense. White and middle class power are simply overwhelming. However, white physical force cannot prevent altogether black physical violence either. Planned and erratic violence will continue -- not only in the summer but throughout all seasons -- wherever and whenever a male believes he has no other social way to act out his manhood.

The alternative to male violence from the ghetto is so simple that few will brave it. It is just this -- guarantee to every man productive employment, with the United States Government as the employer of last resort. Despite the fact that this idea is currently making the fashionable rounds of discussion, the idea itself has no future. To be feasible at all would require a massive change in white man's attitudes toward black man's ghetto world. At best, that is a long long-term prospect which could take us well beyond the twenty years allowed this study. Nevertheless, education might seriously begin that white line of inquiry now. At some point, short-term policies will run out of time, and the ideal itself may become the only practical solution left.

The actual short-term alternatives likely to be employed will be more modest. Education, business, industry, and labor will have to search together for ways to make many ghetto males productive employees. The pieces of this short-range alternative already exist throughout the country. The Chicago "Jobs Now Project" of business, industry, and labor, the "Private Industry's Factory Classrooms", "Apprenticeship Programs" for ghetto males, plus the whole arsenal of formal vocational education programs, as well as training opportunities in non-academic settings such as independent business schools, private trade, technical, and nursing schools, home study agencies, adult education, military training --

all these contain pieces of the puzzling solution. We cannot afford to read any of these agents out of the final picture. The pieces have not yet been brought together into one manageable education-employment policy. But they do exist.

A primary task of policy research during the next decade is to find that policy which will unify existing fragments into effective employment programs. That policy is not now known. What is known is that time is running out for the development of policies affecting male productive employment. Ghetto male violence has, in fact, succeeded in making the lateness of the hour visible to many decision-makers of the society-at-large. If pursued with deliberate speed, short-term policies will be found in time -- but not in time to prevent considerable male violence during the next few years.

b. The Female Relation to Society:

Female socialization in the ghetto has been far more successful than male. For the ghetto Negro, the woman's role of mother has not been feared, resented, or denied by whites with the same fierceness as has been the father's role of provider. Eric Erickson puts it squarely: (38)

> "The systematic exploitation of the Negro male as a domestic animal and the denial to him of the status of responsible father are...two of the most shameful chapters in the history of this Christian nation."

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(38) Eric H. Erickson, "The Concept of Identity -- The Negro American," Part II, loc. cit., p. 162.

The Negro ghetto father appears only under the heading of "absent," states Erickson -- a condition which shows in striking relief the "strong mother" within the ghetto family. But he asks, "Can Negro culture afford to have the 'strong mother' sterotyped as a liability? These mothers have put an indelible mark on 'Negro culture', and what they accomplished should be one of the proudest chapters in cultural history."(39)

The point deserves emphasis, since there exists a growing tendency among white researchers to look at ghetto socialization solely as a problem. The role which Negro mothers have played in the socialization process constitutes a source of strength of truly heroic proportions. There is great danger, however, that the current white interest in the Negro ghetto will carefully teach ghetto mothers to feel ashamed of their strong and affable role as family head. This would constitute an added indignity of intolerable contempt. As one Negro woman exclaimed, "My God, what am I supposed to be integrated out of? I laugh like my grandmother -- and I would rather die than not laugh like that." (40) Is even the hearty laughter of the Negro mother to join those aspects of ghetto culture that are suspect?

There is considerable evidence, also, that the ghetto schools are doing a better job in preparing females for employment than males. Negro females are both more widely represented and find easier admission into the labor market. Ghetto students do not find this description alien to their experience. Said one unemployed high school graduate of his ghetto school:

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(39) Ibid.

(40) Ibid., p. 159.

> "Girls can always find life easier than the boys. They can get better jobs and get more money. They teach more courses for the girls in school. Very little they teach the boys in high school gets them a job. It comes back to this -- the schools are behind the times, compared to the suburbs... There has to be more challenge to the mind."(41)

The Kaufman report on "The Role of Secondary Schools in the Prepartion of Youth for Employment" found that"vocationally oriented young girls were twice as likely as males to choose courses that could prepare them for jobs." (42) The "why" of this differential in choice among males and females brings the analyst back to the question of motivation and socialization for employability.

For Negro males and females receiving vocational training, the Kaufman report makes the following pertinent observations:(43)

> (1) "Compared to whites receiving similar vocational education, "Negroes both started at lower average wages and received smaller increments than did white graduates."

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(41) Donald Joyner, Fides Neighborhood House, Washington, D. C. in interview with D. N. Ruth, August 23, 1967.

(42) Jacob J. Kaufman, et.al., The Role of the Secondary Schools in the Preparation of Youth for Employment, Institute for Research on Human Resources, University Park, Pennsylvania: The Pennsylvania State University Press, February 1967, Chapter 10, p. 12.

(43) Ibid., Chapter 9, pp.29-47 ("The Negro and Vocational Education").

(2) "Negro graduates seem to be as well trained as whites."

(3) "The differences...suggest they could be attributed more to employment discrimination than to quality of preparation."

(4) "The environment of the Negro and white graduates differed substantially."

The report makes no causal connection between the above points. It remains cautiously descriptive. But no one can miss the potential hypotheses embedded there -- particularly those relating the effects of "discrimination" and social "environment" on employability.

Another inference follows for male and female socialization. The pattern of "discrimination" and "environment" would affect female job motivation less than male, since the role of mother in the ghetto family remains unattached from employment and relatively unattacked from society-at-large. The female can bear discrimination in employment and still feel the productive woman in her home. This is not the case for the male. The roles of father and man are intimately tied up with productive employment. To be discriminated against in employment for the male, undercuts the motivation for both social roles. The providing father and the productive man both currently require employment in our society. The place to harm male socialization most is by making him un-employable...and this is just what has been happening.

Nevertheless, a man must manifest his manhood. If not through productive employment, the last resort of his integrity and freedom will be his capacity to hate. You may lock a man up in an unproductive cage, but he reserves the right to hate you for it. That much integrity a man will insist upon. Hate and violence are man's last psychological affirmations of his own freedom and dignity.

2. Change in the Self's Relation to Other Selves:

When a moderate Negro leader like Whitney Young says that the real feeling of the Negro now is, "liberate me or exterminate me", the message begins to come through.(44) The words "genocide", "concentration camps", and "ovens" are regularly used today in the Negro ghettos. Many young Negro leaders are convinced that Hitler's solution for the Jews will be white man's final solution for American blacks. Said one national leader in Los Angeles, in what was considered typical throughout a Washington Post survey: (45)

> "How long do you think this man (white) is going to allow black folks to burn up his cities? Isn't property more important to him than people? I can see it coming: Ovens for black people."

The survey also interviewed young Negro males who were out of work and out of school, but who were unmotivated to join any job training programs. The answers they found went this way:(46)

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(44) Whitney Young, Executive Director, The National Urban League in interview on A.B.C.'s "Issues and Answers", Channel 7 in Washington D.C., September 24, 1967.

(45) "Outlook," Washington Post. Section C, September 24, 1967, p.l.

> "Ain't no use. Man gonna get me, kill me off, no matter what I do. Here in the street one night, maybe. Maybe on the freeway, he stop me: BAM. or maybe over there, ya know, Vietnam. That's the cool way. Me and the Vietcong out there. Bang. Bang. Me dead Or the Vietcong dead. Either way the white man won."

The full impact of these outspoken black attitudes is almost impossible for whites to grasp -- particularly white liberals whose self image as a helping, supporting benefactor possesses no conceptual or emotional tool by which to assume (take in) the idea of themselves as potential Nazis. The gap between black attitudes toward whites, and white attitudes toward blacks, could not become wider and still remain within the concept of "human". This change in the self's relation to other selves has gone about as far as it can go. The next step is either suicide or murder.

Psychologically, there could be something positive about such extreme polarizations between peoples. The facing of partial suicide may signify the death of one attitude prior to a rebirth of a new one. It may be that something negative in the Negro self-concept must die before he can relate positively to the currently feared and hated whites. Something also must die in the white man's self image, if any rebirth in interpersonal and inter-racial relations can become enduringly constructive. If these extreme ghetto attitudes represent a needed psychological catharsis, the change among selves will be positive. However, if all this is but a prelude to acting out racial fears and hates, we face a "self-fulfilling prophecy" of murderous portent.

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(46) Ibid.

The short-term implications of these changes point directly to the importance of the socialization process. The preparing of ghetto youth to perform social roles must be done primarily by blacks, not whites. This is not a question of white ability, intention, or even desire. At some future point, such qualifications alone can become decisive. For the immediate future, it has become extremely important that the Negro family, the Negro school, and Negro employment in the ghetto function predominately on the basis of black strength with black leadership.

The reason is not moral; it is socio-psychological. Group identity and group solidarity for black ghetto residents require this kind of temporary black catharsis. The essential questions are: (1) What will place the destiny of the black family under black socio-economic control? (2) What will put the black ghetto school under effective black leadership? (3) What will bring black business management into recruiting and training black employees in ghetto communities?

The answers to these questions have nothing to do with the myth of setting up a separate black state. Psychologically, the questions relate to a narcissistic black developmental phase which a person must go through if he is to advance to freer interactions. Sociologically, the questions relate to the development of black group pride if blacks are to advance to broader social responsibilities. The primary role of whites during the immediate future will be to help change attitudes and policies among whites, which will assist blacks in formulating and directing policies affecting ghetto families, schools, and employment.

The black ghetto man no longer believes, however, that white man will allow him to grow up socially and economically. He does not believe white promises any more. Whitney Young describes this feeling among many blacks: "We see the resistance of whites to help rebuild the burned out blocks of Detroit and rebuild the city slums. We also saw the whites'willingness to rebuild millions of city blocks in West Germany after World War II -- yet white Germany set out to destroy our whole American society. It is a question of priorities... a question of the credibility of our country."(47)

3. Change in the Self's Relation to Other Social Objects:

People not only can change their attitudes in relation to society-at-large and to other persons, they also can change their attitudes toward people as social objects. The social object of interest, here, refers directly to socialization for employment. How do ghetto residents look at those people and groups who formally represent employment possibilities? A corollary question concerns motivation. How will ghetto residents respond to the employment opportunities available to them?

The participation of Negroes in the apprenticeship programs currently in effect in our society offers some hard data for consideration.

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(47) Whitney Young, loc. cit.

A survey of apprenticeship programs in the construction industry reported the following:

a. There were only 38 Negroes, among a total of 3,575 known applicants, to five apprenticeship programs sampled in the South.

b. There were 11,689 applicants to apprenticeship programs outside the South, only 3% of whom were Negroes.

The survey concluded that "Negroes were only 2.7 percent of the known applicants and only 1.7 percent of the known selectees." (48) Why this seeming lack of interest in social groups representing employment possibilities for Negro Americans -- in and out of the ghetto?

One answer is contained in another report by The Journal of Human Resources. An examination of the effect of low educational attainment on income among selected ethnic groups revealed all but one familiar conclusion. The familiar findings were: (49)

a. "A given educational attainment has less income value for disadvantaged minority groups than for the majority."

b. "Achievement of majority levels of income is delayed until long after the ethnic group has matched majority educational attainments."

c. "Educational attainments accounted for less than half of the difference between the median incomes of minority and majority groups."

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(48) Ray Marshall and Vernon M. Briggs, Jr., "Negro Participation in Apprenticeship Programs", The Journal of Human Resources, Vol. 2, No. 1, Winter 1967, p. 58.

(49) Walter Fogel, "The Effect of Low Educational Attainment on Income: A Comparative Study of Selected Ethnic Groups," The Journal of Human Resources, Vol. 1, No. 2, Fall 1966, p. 22.

The one non-familiar finding of this report has immense policy implications for increasing ghetto motivation in employment. The report concluded "...in our society, the flow of causation is frequently from income to education, rather than in the reverse direction."(50) This means that a man with income is far more likely to seek improvement in employment than a man who begins with no income. A man with something to conserve is far more likely to want to learn how to conserve it. A man with a minimum standard income is the man motivated to perform constructive social roles.

There are currently three ideas on the public table, each designed to put income in the hands of the ghetto family: (1) the guaranteed income, (2) the negative income tax, and (3) a family or children's allowance. The guaranteed income is described in Robert Theobald's book as "The next step in socioeconomic evolution" --"The right to a livelihood must be recognized and guaranteed as a constitutional civil right." (51) The negative income tax refers not necessarily to a formal legislative and policy change, but to a redistribution of income through the existing tax structure. The family or children's allowance already exists in 60 countries, has been a policy of Canada since 1944, and was first proposed in the United States by Paul H. Douglas in 1925.(52)

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(50) Ibid., p.40.

(51) Robert Theobald, (ed.), The Guaranteed Income: Next Step in Socioeconomic Evolution, Garden City, New York: Doubleday and Co., 1967, pp. 126, 127.

(52) See especially the summary article, "The Case for a Family Allowance", The New York Times Magazine, The New York Times, February 5, 1967, pp. 13f.

The problem is that none of these ideas for getting income into the hands of the poor-- income meaning security, dignity, and constructive motivation -- are likely to occur. White middle class Americans are simply not ready to allow such a direct attack on black underclass problems.

The national interest and the national instinct do not coalesce on this point for any national action to occur in the immediate future. Only long range changes in white attitudes will make any one of these three ideas feasible. In the meantime, the less effective and more costly route of"education to income", rather than "income to education", will proceed with increasing, although partial, success.

4. Change in the Self's Concept of Self:

A growing body of knowledge is developing concerning the importance of the Negro self-concept. Most impressive among the emerging insights are those summarized by William C. Kvaraceus, as part of the report from the ongoing "Workshop on Employment Problems of Negro High School Graduates." He cites fifteen crucial issues affecting the self-concept of the Negro, all of which are consistent with the above discussion, and six of which are particularly relevant here. They are:(53)

a. "I suggest for our purpose (high school education) that one of the most practical categories is in terms of social class." (p. 96, No. 4)

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(53) William C. Kvaraceus, "The Negro Self Concept," Workshop on Employment Problems of Negro High School Graduates, Cleveland, Ohio: Western Reserve University, Part II, (edited by Anne S. Pruitt), 1965-1966, pp. 95-100.

b. "The educational and psychological needs and interests of boys and girls are significantly different, but are seldom differentiated in your program planning." (p.98, no. 9)

c. "Basic to any program for disadvantaged youth is the teacher's perception..." (p. 98, no. 10)

d. "Most programs that have been developed, particularly in the work-study area, actually degrade the self-concept, for they are dead-end jobs without a career line." (p. 99, no. 11)

e. "Counseling theory as it is currently practiced favors the middle class mentality. I see it as much too passive, much too verbal,as much too intuitive, much too symbolic." (p.99, no. 14)

f. "We've got to look at the school as a social system." (p. 100, no. 14)

These six points call special attention to the relation of the Negro self-concept to class, sex, teacher perception, career development, mental health, and the social system itself. Jacob Kaufman reaches the same conclusions concerning the role of secondary schools in preparing Negro youth for employment. He summarizes, "If these conditions -- employment and union discrimination, (school) guidance, and family environment -- were to change, the relative outcomes of the various curricula might not be significantly different" (as they actually are).(54) Armed with these insights what changes can we expect in the self-concept of the Negro ghetto resident?

(1) Leadership and self-determination will be sought, demanded, and assumed into the Negro self-concept with increasing consistency.

Many Negro males are currently writing an heroic story of leadership and manhood in the jungle battles of South Vietnam. They will not return to ghetto degradation with the same docility as they have from previous wars. If this rich source of black leadership is not met at the returning boats with viable plans for productive employment, many will carry on the guerilla battle in their own city jungles.

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(54) Jacob J. Kaufman, et.al., loc. cit., "Summary, Conclusions, Implications, and Recommendations," Chapter 12, p. 10. (Underlining is added.)

Actually, these returning black veterans represent an unparalled opportunity for assimilating new black leadership into the black community. If this opportunity is missed by education, business, labor, and government, the socio-psychological costs will exceed a hundred-fold the certain economic loss resulting from inaction.

(2) Sex will continue to support more of the psychological system than it can constructively bear.

Both male and female ghetto residents will try to experience through sexual activities everything that is denied them through other forms of social intercourse. Sexual activity will fail to enhance the self-concept on a permanent basis -- not because sex is unimportant, but because social interaction is a multi-dimensional affair.Sex too much is simply too little.

Educational institutions will increasingly introduce courses in sex education into the ghetto schools. If such courses, however, present only mechanical and technical assumptions (so pervasive in much current discussion of the "pill"), the overall effect will be negative. Sex education, particularly in the ghetto, needs to be placed within a broad family and social context, with careful attention to class and community differences. "Special education for family living" (55) comes much nearer to placing sex within a constructive social context. A comprehensive sex education policy would make a salutary addition to the Negro self-concept.

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(55) A policy recommended by Dr. John Dillingham, loc. cit.

(3) Negro ghetto youth will increasingly demand that he be defined by what he is, not by what he is not.

Too much analysis of the Negro family amounts to nothing more than defining it by what it is not--not white. Too much analysis of the ghetto school amounts to defining it by what it is not -- not suburban. Too many people in the ghetto still think of themselves only in terms of what they are not -- not white. Too many employees look at Negro ghetto residents only on the basis of what they are not -- not middle class.

The ghetto family is..., the ghetto school is..., the ghetto person is..., and ghetto employment could be! Each needs to be analyzed and understood on its own terms. Each has its own structure and its own functions, with an integrity worth determining. What is required is a massive infusion of mental health skills into the whole fabric of the school system -- into the administration, the teachers, the guidance-counselors, related parent and community associations, and the students.

To teach a little boy to define himself by what he is not -- not a little girl, for example -- can do permanent psychological damage to a self-concept. A little boy needs to learn what it means to be a little boy and a young man. The ghetto youth deserves and requires an equally manly chance for mental health.

(4) Negro ghetto youth will accelerate their quest for dignity...and to the extent that dignity is denied, the demand for it will be exaggerated and often offensive.

Folk singers have a way of sensing the style of an age more naturally sometimes than social scientists. Black and whites have been singing about human dignity with increasing volume. In itself, this is a moral and social fact of considerable import. More directly important are the questions these songs ask of whites:(56)

"How many roads must a man walk down,
Before you call him a man?
How many seas must the white dove sail,
Before she sleeps in the sand?
The answer, my friend, is blowin' in the wind,
The answer is blowin' in the wind."

"How many years can some people exist,
Before they're allowed to be free?
How many times can a man turn his head,
And pretend he just doesn't see?
The answer, my friend, is blowin' in the wind,
The answer is blowin' in the wind."

"How many ears must one man have,
Before he can hear people cry?
How many deaths will it take 'till he knows,
That too many people have died?
The answer, my friend, is blowin' in the wind,
The answer is blowin' in the wind."

Negro ghetto youth expect that the family, education, and employment will admit into their institutions the dignity of this fresh breeze.

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(56) "Blowin' in the Wind" -- a folksong currently made popular by Bob Dylan.

(5) Change in Objective Aspects of the Self:

The essential consideration of change in the objective aspects of Negro ghetto youth is age. Twenty years from now will ghetto youth mellow in their demands for social change? Will adulthood temper, as is our social custom, the zeal of youth for socio-economic reform? Will the Negro youth, who initiated the civil rights movement, be outdated and outmaneuvered by age itself? Are educational and employment realities really going to be different this time?

For today's youth culture, to be over thirty is the original sin. What happens when these young Turks commit the unpardonable American act of aging?

The answers are not clear-cut. Youths vow, like their parents before them, never to ossify into middle aged attitudes. (Old age, of course, remains totally unthinkable, just as the thought of middle age is unbearable.) The weight of historical analogy suggests that belief in any lasting attitudinal changes among aging groups represents either a childish refusal to grow up on that part of the young or a romantic hangover for the not-so-young. Maybe so...but new processes of attitudinal changes have been set into psychological orbit. In some real sense, the age that is arriving requires permanent psychological changes.

Today's youth call for more flexible and less ideological attitudes toward social problems. They call, too, for an adaptive, not a success-oriented, cluster of values. On this point, youth of 1968 just might be different this time. The middle aged citizen of 1988 may well have to be far more flexible and adaptive in his attitude and value structures than even his younger self now realizes. In any case, this "belief" by today's youth will remain of very "practical" importance throughout the next two decades. Any belief, whether true or false, constitutes a social fact.

No one, not even youth, can hold on to a belief. Psychologically, beliefs will not keep. You have to do something with a belief. This time, beliefs and attitudes are being "acted out" in the ghetto communities. To the extent that these actions remain flexible and adaptive, they will overcome age.

E. Changes in the Physical Subsystem

E. Changes in the Physical Subsystem

Consideration of the physical subsystem brings into direct focus the role of technology in general, and educational technology in particular, as it is likely to affect ghetto education. Technology relates cultural ideas to physical materials. This particular relationship carries dynamic significance throughout the entire social system.

It is not necessary, here, to try to settle the issues pertaining to a technological theory of social change. This is one of a dozen major theories of social change, each with its own set of adherents and propositions. In American society, educational technology, as the primary agent of educational change, has many followers -- far more, in fact, than the proponents of a technological theory of social change in general. (57)

Whatever one's theory of social change, all social scientists are interested in the answers to these questions: (58)

(1) "What encourages or stimulates a man to invent something, to introduce an invention into society?"

(2) "To what may we attribute the fact that some inventions are accepted and others rejected?"

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57. It is obvious from the content and organization of this paper that I do not hold a technological theory of social change. Similarly, I do not adhere to the corollary theory which claims that educational technology is the decisive factor in educational change. No theory of social change can, or wants to, ignore the importance of technology in its many social forms. My own view does not see the entire social system reduced to this one, albeit important, dimension.

58. Robert Bierstedt, The Social Order, loc. cit., p. 540.

(3) "What determines when a society is 'ready' for an invention?"

(4) "How does it happen that when a society is 'ready', the same invention will be made simultaneously and independently by different people?"

Each of these questions can be specifically applied to the educational system itself. Ghetto education is particularly interested in the readiness of society to introduce existing educational technologies into its poorest schools.

The readiness of American society to introduce technologies in general, and educational technologies in particular, into ghetto education will be briefly examined from the viewpoint of the following types of change: (1) bio-chemical change, (2) change in the natural order, (3) change in the energy-matter distribution, and (4) temporal-spatial changes. No attempt is made here to deal with educational technologies as a subject in itself. (60) The focus here seeks to spotlight the readiness of society to appropriate technological innovations within ghetto education.

1. Bio-Chemical Change:

Changes in bio-chemical knowledge will affect decisively the role of medical technology within the next two decades. No area of medi-

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60. The subject of educational technology, from the viewpoint of education itself, is being fully covered by other staff members working on the Office of Education project of the National Planning Association.

cal education will remain unchanged by medical technology, and almost no area of medical service will go untouched.

Educational institutions will relate to changes in medical technology by expanding their general health service functions within the community-oriented schools. Some of these changes will also reach the ghetto schools and communities -- but in comparison with middle and upper class schools, not much. The on-coming benefits of medical technology will be limited to initial mass diagnostic services within the ghetto areas. Through mobile clinics and school-affiliated health units, medical technology will extend considerably the diagnostic services available for the poor.

Prolonged health care and changes in health care attitudes will not come to the poor of the land by 1988, on the basis of present social and educational policy assumptions. The capacity to plan for, afford, and utilize health services is positively correlated to middle and upper class membership. Medical sociology has been aware for many years of the many motivational obstacles to the improvement of lower class health.

According to Dr. Harold C. Sadin, M.D., only through health education for the family and through the schools, along with medical doctors working in poor communities, will basic changes in health attitudes occur among the poor. The likelihood of this possibility for the poor of 1988 is not currently promising. (61)

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61. Dr. Harold C. Sadin, M.D., George Washington University Hospital, Washington, D.C., as reported to D. N. Ruth, October 2, 1967.

To change health attitudes of the poor will first require a change in social attitudes of medical education and medical doctors. For reasons that remain somewhat obscure, doctors, in every society studied, tend to change their professional technologies long before their private "sociologies." A direct attack by educational institutions on medical sociology might lead to salutary changes for all future classes -- eventually, even for the poor.

2. Change in the Natural Order:

Nature has been our silent partner in the social system. Not since the days of Frederick J. Turner has geography dared to claim a major influence on social development and change. With his "The Significance of the Frontier in American History" (1893), Turner expounded the thesis that American institutions were born out of the American forest and shaped by our frontier experience. Walter Prescott Webb's, "The Great Frontier" of 1952, offered one updated extension of the Turner thesis. But among social scientists, nature's voice seldom received a contemporary hearing. Man has become disenchanted with his silent sister, Nature.

Nature is about to speak to man again -- to society at large and to the slums in particular. That "restless mobility" of the frontier spirit, which Turner first described, is just the beginning of Nature's future voice. A whole new assertion of Nature's impact on the social system is speaking up in the emerging discipline called "social ecology" --the study of "the relationship of man to the environment he himself has created."(62)

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(62) Joseph G. Herzberg, "A New Discipline: Social Economics, Man's Ecology in an Altered Environment, " The New York Times ("World Perspectives" series), October 1, 1967.

Dr. Aldolf Lowe of Germany recently described social ecology as concern with "pure air, unpolluted water, privacy, mental health, open space, the liveability of cities..."(63) Social ecology is Nature's last way of demanding of man to be heard again.

This is what Joan Baez sees in the rain, when she sings:

> "Just a little boy, standing in the rain,
> A gentle rain that falls for years.
> The grass is gone; The boy disappears;
> Rain keeps falling like helpless tears.
> What have they done to the rain?"

Through man's technological innovations, the very foundations of Nature itself could be permanently silenced. The blade of grass, the deer and his forest, the tree that grows in Brooklyn -- all could wither and die silently with the fall of nuclear rain. Such a metamorphosis of rain-- from a life to a death-giving natural force -- means that our hithertofore silent sister is about to speak.

Nature will speak first to urban man. She wants man to rediscover, what city planners now call, "the liveable environment." In a literal and symbolic way, Nature demands that modern technology clear the air that it has polluted, in the interests of social ecology. This was the main theme of the Conference on International Housing and Urban Growth, which the world's leading city planners attended last year.(64) The conference drew a remarkable variety of vocational representatives to listen to and interact with the city planners. Architects, philosophers, businessmen, technicians, plus experts in education, mental health, religion, and government arrived. The conclusion of the entire conference was this -- what most needs building is neither a house nor a city, but a liveable environment.(65)

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(63) Ibid.

(64) Special Conference on International Housing and Urban Growth, presented by the International Development Conference and the National Association of Home Builders, Washington, D. C., September 23, 1966.

Technology has much to do with rebuilding a liveable environment in our inner city slums. Technology can develop to the point where inexpensive and liveable housing becomes a reality for low income urban citizens. Private industry can broaden the productive base within urban settings in ways that employment is accessible to the poor. All this the conference of city planners proposed. But their main thrust was that public efforts and public funds should concentrate on making the urban environment more humane, i.e., parks, schools, recreation centers, transportation, water, air, etc. Let the limited resources of public efforts build the urban environment, not the house alone.(66)

Charles Abrams, Chairman of the Division of Urban Planning of Columbia University, warns us that, unlike the beaver, man is not a natural builder. He even offers urban development as the latest confirmation of Darwin's thesis that man descended from monkeys. He observes, "As a monkey, man lived in a tree; when he came out of the tree, man moved into a prefabricated home -- namely, the cave. So man never became a master builder. After centuries, man did learn to build barns for his animals rather well. But when he moved to the city, this one rural building skill he managed to acquire was useful to no industry."(67)

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(65) Ibid.

(66) Ibid.

(67) Ibid.

Since man is not a natural builder, man needs training to build and live in liveable cities. Charles Abrams calls for three kinds of training: training for (1) policy planners, (2) city designers, and (3) construction engineers. A special training in social ecology is what he has in mind, however -- training that takes seriously the cultural and class differences of each inner city community.

Technology in general and educational technology in particular have much to learn by listening to Nature's voice. No one doubts anymore that urban housing and urban schools need re-thinking, re-styling, cleaning up. But what kind of environment are we building for? To what end? What quality of built-in living do we value for 1988?

A twenty-year period for the building of liveable urban environments is hardly an impracticably long time. What we build in 1968 will still be around in 1988 -- whether planned or not planned. Our long-range interest in social ecology for the inner city poor has a curiously contemporary and urgent ring to it. Educational leaders need to take Nature seriously, for they may be the only ones capable of doing so. As the nature-loving aboriginals of Northeast Arnhem Land claim, "In the beginning, we were all birds." Some of us still are!

3. Change in Energy-Matter Distribution:

Modern technology is nowhere more successful than in its capacity to universalize the distribution of energy-matter. The appropriation of the energy sources of light and water through technological control will be one of 1988's happiest commonplaces. Most outstanding of all are the potential contributions of educational technology to the Negro American urban poor.

Educational technology will eventually make available for all social classes of students the possibility for an individualized education. Students working in individual carrels before computerized teaching-machines with direct dial access to entire libraries of pre-planned programs will contribute much to universalizing the standards of American education by 1988. The poor will be the last to receive such benefits. But before too long, Marx's dictum will be updated even for the poor, in this manner: "To each, according to his machine."

The benefits of educational technology for both individualizing and universalizing American education are impressive. No one can doubt that. There remains a particular problem for the urban poor, however, which dare not be forgotten. Many have mentioned it, but perhaps Sumner Myers said it best, "Attitudes are a major factor in determining the rate of innovation."(68)

Sumner Myers says what social psychology has determined for many years, and rather convincingly too, that the key to motivational change is the reference group with whom one identifies. The reference groups of the Negro American urban poor are not going to change by educational technology alone. The basic reference groups for students will continue in 1988 as they are today -- one's family, one's peer groups in school, and one's peer groups on the community streets. Educational technology will have some influence in changing the content of these reference groups, but not their forms.

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(68) Sumner Myers, "Attitude and Innovation", Science and Technology, No. 46, October 1965, p. 91.

If policy research fails to take into consideration these specific reference groups for the ghetto schools, educational technology will degenerate into a dusty toy, rather than the shining promise it actually holds. To expect more social change from educational technology than it can fulfill is to repeat the same kind of mistakes that have been made thousands of times before. Education-in-general should teach us to benefit from our past mistakes. We just may no longer have the time to remake all our social mistakes again.

S. M. Miller of the Ford Foundation's Office of Social Development adds this note in reference to the urban poor: (69)

> "I think there is the notion of the slot machine; you pump in the data and results come out true or false. I don't think that's the situation we are in. We are in a situation of exploration not experiment...I am frankly disturbed by some of the things that are going on in Washington -- the excess emphasis upon a limited set of measurements of what is a social benefit...we act as though we can really make these decisions on scientific grounds rather than on value grounds."

Educational technology offers education much promise, but it offers no escape from the harder and more honest look at social values.

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(69) S. M. Miller, "Weighing the Alternatives", New Generation (formerly American Child), Summer 1967, p.23.

4. Temporal-Spatial Change:

One of the most uncomplicated areas in which educational technology will positively affect general education is temporal-spatial change.

Today, education is strictly tied to chronological time. There is clock-time for every aspect of education: (1) clock-time for school classes, (2) clock-time to determine when schools open and close, (3) clock-time for the annual passing or failing of grades, (4) and clock-time when a person is to leave the educational system itself. This current temporal rigidity will substantially change during the next two decades toward a new concept of experiential time.

Educational technology will make it possible for many students to give up clock-time in favor of time-as-experienced. It will become possible for students (1) to study a subject at their own speed -- not by timed classes, (2) to use the school facilities for study on their own time -- not be locked out by mid-afternoon and all summers, (3) to advance through levels of graded comprehension on their own time -- not by the annual ticking of the clock, and (4) to come and go to an educational center during any period of their life -- not be required to cease education by the late teens or early adulthood. Time will be liberated from the clock, as will much of education itself.

Space, too, will become far more unbounded, through advances in educational technology. School buildings will literally become mobile and adaptable from within. Geometric space in education will be freed for experiential space. Flexible partitions and movable walls will become adjustable to the needs of individual and group experience. The four cornered rooms of today's school buildings will be as curious an oddity in the 1988 school as the eight cornered one-room school in my home town. Space will be unbounded for the needs of student experience.

Such temporal-spatial changes have already been built-in to a few of the wealthiest school systems. And the middle class schools are sure to follow. The poor of the future will have to wait much longer for liberated time and unbounded space in their schools. But it will come, even to them, by 1988. Our society builds buildings with much greater readiness than we build people. Buildings, alone, will not change people, of course. But in the meantime, they can certainly help.

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Generally, the impact of educational technolgy on educational institutions is very encouraging. For the poor communities, the projection must be far more modest, however. In contrast to wealthier schools of wealthier communities, the poor of 1988 will still be motivated primarily by their reference groups, and still be de-motivated by the prevailing remnants of white and class discrimination.

Gunnar Myrdal reached a similar sentiment before a recent conference of 2,400 planners and allied professionals. His generally negative projections for the poor of American provoked his audience to ask him to justify the "pessimism" of his talk. He sharply responded:(70)

> "To believe that you need optimism to have courage to do the job is a weak and shameful view. You must have the courage of desperation."

To look honestly at the physical world of the poor is to see desperation. To face the poverty of white readiness to allow basic social changes among the poor leads to even deeper desperation. To the extent that both kinds of desperation are taken seriously by policy planners, we may find the courage for change among both the blacks and the whites.

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(70) Gunnar Myrdal as reported in The New York Times, "Myrdal Warns U.S.", The New York Times, October 3, 1967.

IV. Implications for a Center for Educational Policy Research

IV. Implications for a Center for Educational Policy Research

This study concludes with two very unspectacular findings. Both have permeated the analysis of every aspect of the social bases for the education of the Negro American urban poor during the next two decades. They are simply these: (1) that the basic cause of discrimination will continue to be discrimination, itself, and (2) that the continuing result of discrimination will continue to be discrimination.

At every level of the social system -- cultural, social, psychological, and physical -- there extends the challenge to root out discrimination from our social values and class attitudes. Success for that social goal would be very far from unspectacular. To achieve it by 1988 would require a fundamental and prompt attack by educational institutions on the very value cores of American attitude formation.

The foregoing analysis suggested that many kinds of social changes will affect in varying degrees the future education of the Negro American urban poor. Some changes will be impressive, many significant, but none sufficient in themselves. Discrimination will ultimately be overcome only by overcoming discrimination. It is both that simple and that fundamental a problem. Only when educational policies are logically and comprehensively related to this social goal will the solution to this social problem emerge.

Many short-cuts to overcoming discrimination against the Negro American urban poor will be tried during the next twenty years, just as many have been tried during the last two hundred years. None can succeed without deliberate policy direction toward this social goal. No policy is sufficient, which does not direct itself to value and attitude changes among those dimensions and structures of our society where discrimination continues breeding upon itself. In the area of value and attitude change, few short-cuts endure.

The study has proceeded throughout on the basis of a twenty-year time projection. Such a time dimension contains within it definite policy implications. Policies that could be effective within a twenty-year period differ from those of a ten or fifty year time frame. In every phase of this analysis, the policy implications were identified in terms of 1988 social goals requiring 1968 policy decisions.

The following charts point to those specific social changes analyzed, to the projected response of education, and to the policy implications derived from them. The focus, again, is the future education of the Negro American urban poor, not education in general. The latter often would require very different policy implications than those of the Negro urban poor. The assumption of the charts is consistent with the affirmation which John W. Gardner made before a national television audience. Said the Secretary:(71)

> "I happen to believe we ought to take the long view...we ought to do a really thorough long-term job of altering the shape of our cities...I really believe it is possible."

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(71) John W. Gardner, Secretary of the United States Department of Health, Education, and Welfare, Channel 5 television broadcast, Washington, D.C., 1:00 p.m., September 24, 1967.

I believe, also, that we can banish discrimination from the American society in general, and from the education of Negro urban Americans in particular. But there is no spectacular answer. The solution requires that educational policies be related comprehensively to this specific social goal.

Four charts follow, each relating specific changes in the social system to policy research. They are: (1) Implications of Cultural Changes, (2) Implications of Social Changes, (3) Implications of Psychological Changes, and (4) Implications of Physical Changes.

I. IMPLICATIONS OF CULTURAL CHANGES

Cultural Changes in the Social System	Projected Response of Education	Implications for Policy Research
1. Language Change: Continuing use of non-standard English among the Negro urban poor.	1. Intensification of instruction of non-standard English for teachers in ghetto schools. Little success in the employment of teachers raised and educated in urban poor schools.	1. Research concerning the effects of non-standard English (and argot) on teacher-pupil communication, and teacher-pupil values. Analysis of policies designed to expand verbal communications among the Negro poor.
2. Value Changes:	2.	2.
a. Intensification of "achievement" values among the Negro poor.	a. Increasing interest and program development of educational and employment "achievement" patterns for the Negro poor...with modest program success.	a. Analysis of policies allowing the Negro family to "achieve" as an institution among the urban poor. Examination of the effects of the Negro family on educational and employment "achievement."
b. Increasing awareness that the hard-core poor are beyond self-help, but not beyond help.	b. Little awareness in educational program development concerning the deleterious effects of "self-help" valuation on the mental health and social problems of the urban poor.	b. Extensive examination of educational and employment policies based on "self-help" valuations. Development of policy and value changes concerning the meaning of "help" among the whites and middle classes.
c. Growing value conflict between "individualism"and "social unity" among poor and middle classes.	c. No deliberate educational response, since urban schools will become more and more class oriented.	c. Research concerning the policy implications of the individualism-unity" conflict -- between and among classes, and between and among races.

I. IMPLICATIONS OF CULTURAL CHANGES (Continued)

Cultural Changes in the Social System	Projected Responses of Education	Implications for Policy Research
d. No new values.	d. Educational verbalization, with no implementation, of latent cultural values.	d. Analysis of the value bases of current and future educational and employment policies.
3. Symbol Change: a. Metamorphosis of "black"--from decidely negative to positive connotations. b. "Black" as the ultimate good with "white"as the ultimate evil--the logical development of the "Black Power" movement.	3. a. Increased awareness of "black" color symbolism in educational content. Revision of history and social science curricula to make room for "black" contributions. b. Intensified school-community strife concerning the ultimate claims of "black" power. The failure of "black" power to change cultural symbolism in educational curricula.	3. a. Policy reviews concerning curricula development, pertaining to the role of "blacks" in American social and cultural history. b. Broad research concerning the role of color symbolism on educational attitudes, class values, and community interaction patterns.
4. The Forms of Belief: An increase in "universalistic achievement" belief forms among the black poor. A continuing and unsuccessful search for "particularistic-qualitative" patterns among the blacks.	4. No or little responses among educators to relate the forms of belief (not content) to the forms of educational programming.	4. Research identifying the program implications of relating cultural forms of belief to educational forms of instruction.
5. Cognitive Changes An increase in the scientific nature of ideas among the Negro underclasses.	5. The development of educational programs corresponding to the demands of Negro underclasses for an increased scientific ideation of educational content. Some significant attention to class variations of cultural change.	5. Research concerning the role of class identiy on sub-cultural ideas. Policy formulation pertaining to the universalizing of cultural ideas in our Negro underclasses.

II. IMPLICATIONS OF SOCIAL CHANGES

Social Changes in the Social System	Projected Response of Education	Implications for Policy Research
1. Change in Social Values: Intensified valuation of social "progress" among the Negro urban poor.	1. Relative failure of education to bring economic and social "progress" to urban poor communities -- despite the new array of educational ideas ready to march on the ghettos. The failure--due in large measure to the increasing tendency among educators to treat urban poor schools with a de-localized mentality i.e., not taking the class and community values seriously enough in program development.	1. -Policy research concerning the role of the family in promoting educational and employment ideas of "progress" among the Negro American urban poor. -Continuing analysis of the role of education in promoting economic "progress" for those members of the Negro subculture, underclass, and poverty communities. -Examination of the value bases of current and future educational polices designed to promote social "progress."
2. Institutional Changes: a. The continuing primacy of the family in the socialization processes of the Negro poor.	2. a. Sporadic and erratic attempts of educators to relate program development to the structure and function of the Negro American, inner-city family.	2. a. Intensive research concerning the persistence of discriminatory attitudes in white middle class families. Extensive analysis of white family attitudes toward the Negro family of the inner city. The development of policies and educational plans affecting attitudinal changes of white families toward black families.
b. De-centralization in the school organization and decision-making.	b. Abandonment of a policy of integration in American cities.	b. Policy alternatives to the re-segregation of urban education. Research concerning the promotion of quality education in re-segregated urban schools.

II. IMPLICATIONS OF SOCIAL CHANGES (Continued)

Social Changes in the Social System	Projected Response of Education	Implications for Policy Research
2. (continued)	2.	2.
c. The demand for the development of job-oriented goals and training in ghetto schools.	c. Success with limited number of ghetto youth in relating vocational education to job and career development.	c. Research concerning white attitudes which impede meaningful career development among the Negro urban poor. The development of alternate policies of subsidies to poor as stimulates to participation in career development opportunities.
d. Growing tension between the capacity of the bureaucratic structures of government to fulfill its goal-attainment functions.	d. Expanded attempts of government bureaucracies to build into themselves structural pockets of action. Continuing cooperation of government with university and private research associations for the purpose of relating educational and employment needs to resources.	d. Development of policy alternatives to counteract the growing rigidity of bureaucratic structures, affecting educational and employment planning.
3. Changes in the Distribution of Economic Possessions and Social Rewards: The failure of American society to overcome a "poor" class by 1988 -- with growing tensions among that underclass.	3. Little effort on the part of education to change substantially the relative inequality in the distribution of economic possessions and social rewards. Little success in altering the class structure of American education.	3. Extensive research concerning the reasons for the persistance of underclasses in the American society of the future. Detailed analysis of white and Negro middle class attitudes and values, and their effect on the perpetuation of Negro underclasses.

II. IMPLICATIONS OF SOCIAL CHANGES (Continued)

Social Change in the Social System	Projected Response of Education	Implications for Policy Research
4. Changes in Personnel Recruitment:	4.	4.
a. The growing numbers of Negro youth as a potential source for employment.	a. An increasing willingness of the institutions of employment to align themselves with educational institutions in the training of the ghetto human resources. The emergence of joint education-employment planning.	a. Research concerning appropriate policies which can develope meaningful career-lines for the Negro urban poor.
b. Increasing insistence that the rules for recruitment be related to performance, not to paper qualifications.	b. Considerable progress in changing the employment rules, through increasing interaction of education and employment institutions. Less effective rule changes in Government employment than in private business and industry.	b. Policy formulations affecting the government's use and guaranteeing of employment to the hard-core Negro underclasses.

III. IMPLICATIONS OF PSYCHOLOGICAL CHANGES

Psychological Changes in the Social System	Projected Response of Education	Implications for Policy Research
1. Changes in the Self's Relation to Society:	1.	1.
a. Change in the direction of Negro male violence-- toward white urban communities. Negro males will express their manhood as much through violence as through productive employment.	a. Modest improvement in employment openings for Negro urban males. Limited success of vocational education to prepare Negro urban males for productive employment.	a. Research into the reasons for white and middle class attitudes which prevent full and fair employment for Negro males. Development of educational policies affecting attitudinal changes among the middle classes.
b. Increasing defensiveness of Negro females in their roles of family head.	b. No direct educational reponse--except to accelerate present vocational education programs for Negro females in the inner city.	b. Analysis of the Negro female roles of socialization -- in terms of specific subcultures, classes and communities. The development of policies designed to assist Negro mothers of the inner city to overcome the effects of white discrimination on Negro urban youth.
2. Changes in the Self's Relation to other Selves: Increasing polarization of black attitudes toward whites, and white attitudes toward blacks.	2. A modest increase in Negro educational leadership among the urban poor. Partial increase of Negro leadership in business and industry.	2. Analysis of the psycho-social effects of a policy promoting black leadership in black communities--including schools and employment leadership. -Research concerning ways to help black poor families achieve socio-economic positions of independence.

III. IMPLICATIONS OF PSYCHOLOGICAL CHANGES (Continued)

Psychological Changes in the Social System	Projected Response of Education	Implications for Policy Research
3. Changes in the Self's Relation to Other Social Objects: Continuing failure of many Negro poor to participate in the formal programs offering employment possibilities.	3. Accelerated attempts to improve the income of the Negro poor through education -- rather than improving education through income. Limited success with the current urban poor; no success with the hard-core poverty groups.	3. Research into changes in values and attitudes of the middle class, which would allow policies for the improvement of the Negro poor -- through income to education, rather than from the more expensive and less successful route of education to income.
4. Changes in the Self Concept:	4.	4.
a. A growing demand among the Negro urban poor for an increasing role in the development of plans affecting their own destiny.	a. Increased numbers of Negro leaders in black urban schools. Substantial increase in Negro leadership in vocational education. The relative failure of education and industry to appropriate the returning Negro veterans of South Vietnam into the leadership structures of ghetto education and employment.	a. The permanent inclusion of black leadership from the Negro urban poor on the staff of a continuing Center for Policy Research.
b. The over-estimate of sex in enhancing the self-concept.	b. Increasing inclusion of sex education in the schools of the Negro poor--much of it, however, too mechanical to promote comprehensive changes in behavior.	b. Research concerning how to introduce comprehensive sex education in the urban poor schools.
c. Insistence among the Negro urban poor that he be defined by what he is, not by what he is not.	c. Slight introduction of mental health skills into the administration, faculty, teachers, counselors, and students of the Negro urban schools.	c. Research on effective mental health policies for the re-segregated urban schools.

III. IMPLICATIONS OF PSYCHOLOGICAL CHANGES (Continued)

Psychological Changes in the Social System	Projected Response of Education	Implications for Policy Research
4. (continued) d. An accelerated quest for dignity among the Negro urban poor.	4. d. No effective response from education.	4. d. Research concerning the effects of white and middle class discriminating attitudes on white and middle class policies effecting Negro underclass "dignity."
5. Objective Aspects of Self Change: Age -- continuing demands of both youth and middle aged Negro poor for a more flexible and adaptable approach to social problems.	5. A modest response in education for more flexible and adaptable values in meeting social problems within and without the Negro urban schools.	5. Research on value changes affecting educational programs for various age groups of Negro Americans.

IV. IMPLICATIONS OF PHYSICAL CHANGES

Physical Changes in the Social System	Projected Response of Education	Implications for Policy Research
1. Bio-Chemical Change: A rapid increase in the availability of medical technology throughout our society.	1. Extensive expansion of health functions of the schools -- limited primarily to initial diagnostic functions for the Negro poor. Little change in health care attitudes among the underclasses.	1. Examination of policies affecting changes in health care attitudes and the utilization of health services among the Negro American urban poor.
2. Changes in the Natural Order: An increasing need to build "liveable environments" in the inner cities -- with special consideration to schools, homes, parks, and employment accessibility.	2. A modest improvement in building urban schools in terms of social ecology -- more attention to social ecology outside the inner cities than in them.	2. Research pertaining to the relationship of man to the environment he is creating -- need for continuing research. The development of policies affecting social ecology for the Negro American poor.
3. Changes in Energy-Matter Distribution: An increase in the univerzalization and individualization of education through educational technology.	3. Extensive use of educational technology throughout the school system. Less utilization of educational technology in the schools of the Negro poor. The dominant reference groups, not educational technology, continue to be the main sources of educational motivation.	3. Research concerning the relation of reference groups among the poor to the utilization of educational innovations. The development of policy alternatives affecting the motivation of the poor to utilize educational innovations.

(continued....)

IV. IMPLICATIONS OF PHYSICAL CHANGES (continued...)

Physical Changes in the Social System	Projected Response of Education	Implications for Policy Research
4. Temporal-Spatial Changes:	4.	4.
a. A liberated concept of time throughout American society. Time-as-experienced, not clock time.	a. Extensive revision of educational time schedules throughout the school system... less liberation of time in the poorest schools. Time-as-experienced, not clock-time, for educational subjects, classes, grades, use of school facilities, and periods of life available for education.	a. The formulation of policies to facilitate temporal liberation among the Negro poor.
b. The overcoming of geometric space in favor of an unbounded concept of space, throughout American society.	b. Flexibility and internal mobility in the school buildings of both the rich and poor.	b. Research concerning the effects of spatial flexibility and rigidity on educational attitudes and achievement patterns.